THE IRON TRADE REVIEW

VOLUME XXXIX CLEVELAND, MAY 24. 1906 NUMBER 21

MOLDERS' STRIKE

IS HAVING EFFECT ON FOUNDRY PIG IRON MARKET,

But the Demand For Steel Making Irons Is Strong.—San Francisco Orders Will Be Delayed.—Tin Plate Price Advanced.

The strike of iron molders extending to many cities and involving 7,000 to 8,000 men continues to have a depressing effect on the demand for foundry iron, and in most places the market is listless, with a tendency to lower quotations. Even in some places where strikes have been settled, prices are soft, although the demand is very good. The demand for pig iron for steel making is more active than that for foundry irons. The Republic Iron & Steel Co., has purchased 10,000 tons of Bessemer at $17.25 for July delivery, in addition to its recent purchase of 20,000 tons, and the Steel Corporation is anxious to purchase more pig iron for June delivery, as do other large steel interests. The Bessemer Association is showing a disposition to accommodate the companies outside of the Corporation whenever it can do so. The southern producers of pig iron are working more harmoniously, and following the recent announcement of decision of the principal producers in that section to maintain prices, it is reported that four other companies have entered the agreement. A formal association may not be organized, but it seems certain that competition will not result in as much price cutting as it did a few months ago. The price of ferro-manganese has declined until it is now $85.00 for June delivery.

'Frisco Orders Are Delayed. There seems to be no likelihood for orders of structural material being received from San Francisco for any large tonnage at any time in the near future. The clearing of the debris will proceed slowly, and owing to the loss of all data in the city engineer's office and the uncertainty as to where the streets will be located in the future, much time must elapse before plans for new buildings are perfected. Even on contracts awarded before the disaster, delay is expected. At a meeting of the Bar Association, prices were reaffirmed. Chicago mills are somewhat uneasy about orders for the last half. The principal producer of tin plate has advanced the price 15 cents per base box, making the quotation $3.75 Pittsburg. This advance is attributed to the unusually high price of tin. The demand for sheets is very strong, and prices are well maintained. The delivery is slow on galvanized sheets and corrugated roofing.

Billets Are Easier. Billets are a shade easier, but the scarcity of sheet bars continues. Only one mill in the west is offering forging billets, and it is asking $35.00.

Million Tons of Rails Sold. It is estimated that over 1,000,000 tons of rails have been sold for the 1907 delivery, of which the Illinois Steel Co. has booked 550,000 tons, the Colorado Fuel & Iron Co. 200,000 tons, the Tennessee Coal, Iron & Railroad Co. 150,000 tons, while large tonnages have been booked by the Carnegie Steel Co., the Lackawanna Steel Co. and the Cambria Steel Co. The bookings of the past week were not large, being confined mostly to trolley lines. The Carnegie company, however, sold 20,000 tons for this year's delivery.

Boiler Tubes and Pipe. The low prices recently made on boiler tubes have brought out considerable business. Merchant pipe is weak, and the price is ragged. Heavy demand for wire nails from San Francisco continues and business on nails and fencing is good throughout the country. The largest recent order for cast iron pipe was placed a few days ago by the city of New Orleans with Alabama interests for 100,000 tons.

Speculation In Scrap. There has been considerable speculation for scrap in the Chicago market, but, in most places, there is little activity, and prices are low without indications of improvement. The Westinghouse interests have placed an order from 10,000 to 12,000 tons of coke at $2.65 at Connellsville ovens.

TENNESSEE EARNINGS

For 1905 Show Heavy Gain Over 1904. The Year's Output.

(Special Telegram.)

New York, May 23.—Directors of the Tennessee Coal, Iron & Railroad Co., at a meeting held yesterday, elected President John A. Topping chairman of the board and chose other officers as follows; Frank H. Crockard, vice president and general manager; L. H. Hoover, secretary and treasurer; T. M. Nesbitt, assistant treasurer.

The annual report for the year ending Dec. 31, 1905, was also made public. It contains only statistics, with no official comment. Net earnings for the year were $2,075,649, an increase of more than $500,000 over the previous year. Dividend payments aggregated $921,902, a gain of more than $900,000 over 1904, as nothing was paid on the common stock that year. The total surplus Dec. 31, was $2,228,717. The balance sheet shows assets of $42,268,870.

Expenditures for new construction during the year were heavy, amounting to about one and one-third millions. On blast furnace plants $452,710 was spent and at the Ensley steel works $359,050. The average number of men employed was 10,414. The company's iron ore production was 1,436,282 tons; of this 1,282,189 was red ore and the balance was brown ore from the Greeley and Bartow mines. The total production of basic and foundry iron for the year was 529,036 tons; of open-hearth steel ingots, 246,558 tons; of blooms, billets and slabs, 34,961 tons, and of rails, 163,853 tons. Products of the company's rolling mills totaled 25,166 tons.

Republic Pays Back Dividend.

Directors of the Republic Iron & Steel Co. declared the regular quarterly dividend of 1¾ per cent on preferred stock, and two per cent on deferred dividend account, leaving eight per cent remaining to be cleared away.

THE WEEK IN IRON CENTERS.

PITTSBURG.

Republic Buys Besesmer.—Bar Prices Reaffirmed.—Tin Plate Advanced.

OFFICE OF *The Iron Trade Review*
521 PARK BUILDING, May 23.

While the conditions prevailing in a few of the finished lines of the iron and steel market in this district are dull and there is nothing of special interest up for consideration, there have been a few very active spots during the week under review and Bessemer and basic pig iron have been one of them, and on account of the scarcity of both commodities for very early delivery this feature has attracted considerable attention. The Bessemer Pig Iron Association has sold 10,000 tons of Bessemer pig iron to the Republic Iron & Steel Co. for July delivery at $17.25 valley furnaces and the United States Steel Corporation is after more pig iron for June delivery, but the available supply is not adequate, as far as can be estimated at this time to supply all its requirements. The Cambria Steel Co. is out with an inquiry of round tonnage for delivery before July 1.

At a meeting of the Bar Association held in Pittsburg on Tuesday of this week all the old prices were reaffirmed although there was some sentiment in favor of an advance.

The American Sheet & Tin Plate Co., on Friday last announced an advance of 15c per base box on tin plate due to the high market price of pig tin.

The situation in regard to semi-finished steel has not improved, sheet bars still being far below the requirements. Billets are reported a little easier and lower prices have been quoted.

Pig Iron.—The Republic Iron & Steel Co. this week bought 10,000 tons of Bessemer pig iron from the Bessemer association at $17.25 valley furnaces for July delivery, this making 30,000 tons purchased by this company within the past three weeks, 20,000 being for June delivery. The steel corporation is negotiating for more Bessemer pig iron for June delivery and the Cambria Steel Co. is out with an inquiry for a good round tonnage. Bessemer pig iron is very scarce and some of the regular customers of the big producers have been refused on this account. Basic pig iron is by no means plentiful and there has been a good inquiry. Foundry iron has been the only weak feature and while some furnaces are holding steadily for $17 valley, others are offering their No. 2 Northern at $16.75 for early delivery and are quoting $16.50, valley for third quarter. Several of the large consumers of foundry iron have intimated that they will be in the market about the middle of June. Several sales of small tonnages have been made during the past week, but on account of the uncertainty regarding the action of the molders there has been some hesitation. Reports from reliable sources have reached here that the stocks at southern furnaces are low and that the $14 Birmingham price, agreed upon by the big producers some time ago is being maintained. Southern forge has been sold at a shade under $12 Birmingham. Northern Forge is quoted $16.50, Pittsburg. Bessemer is very strong at $17.25 valley in large lots and $17.50 in small tonnages and basic is firm at $17 valley. We quote:

Bessemer Valley	$17.25 to 17.50
Bessemer, Pittsburg	18.10 to 18.35
No. 1 Foundry, Pittsburg	18.00 to 18.25
No. 2 Foundry, Pittsburg	17.60 to 17.85
Gray Forge, Pittsburg	16.50 to 16.60
Basic, Valley	17.00 to 17.25
Basic, Pittsburg	17.85 to 18.10

Ferro-Manganese.—The gradual decline in the high prices which was predicted about two months ago has arrived and ferro-manganese, foreign, 80 per cent, for June delivery is now quoted at $85 per ton in carload lots although from $10 to $15 higher has been paid on lots of a few tons.

Steel.—While there is still some scarcity of Bessemer billets, it is not as marked as it was a short time ago and they are now quoted $26.50 to $27, Pittsburg, with open-hearth $1 higher. The scarcity of sheet bars is as bad as it has been for the past six weeks and $28 is being asked by producers.

Skelp.—There has been some little inquiry, but new business has been light, although the mills are busy on old contracts. We quote:

Bessemer grooved, 1.57½c to 1.60c; sheared, 1.65c to 1.70c; basic grooved, 1.60c to 1.65c; sheared, 1.65c to 1.70c; iron skelp, grooved, 1.65c to 1.70c, sheared, 1.80c to 1.85c.

Hoops and Bands.—This market has been running along steadily without change; new business is light although specifications against existing contracts are in good volume. We quote:

Hoops, 1.90c in carload lots, and 2c on less than carload lots, bands, 1.50c base, half extras as per standard steel card. Prices f. o. b. Pittsburg.

Cotton Ties.—There is still considerable business to be placed for cotton ties, although a big part of the regular contracts were placed immediately after the opening of the market. Deliveries are now being made on these contracts, which were made at 85c. The May price is 85½c and the June price will be 86c.

Muck Bar.—There has been so little inquiry for muck bar that there is really no market at this time upon which to quote a price.

Structural Material.—The market for structural steel, as far as strictly new business is concerned, is dull and there is nothing of particular interest up for consideration. The mills are filled up for several months ahead on old contracts and the demand for deliveries on heavy angles, beams and channels is imperative. We quote:

Beams and channels, 15 in., and under, 1.70c; over 15 in., 1.80c; zees, 1.70c; tees, 1.75c; angles from three to six inches, inclusive, 1.70c; over six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.60c base.

Plates.—The actual specifications against existing contracts are very heavy and mills are being pressed for deliveries on sheared and universal plates, but the market on new business is dull and listless and shading in prices by independent mills to the extent of $2 per ton has been reported. Several of the independent mills are in need of business. We quote:

Tank plate ¼ inch thick, 6¼ to 100 inches, 1.60c f. o. b. mill, Pittsburg. Extras are as follows per 100 pounds, boiler and flange steel plates, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates, varying not more than four inches, in width at ends, narrowest end not being less than 30 inches, 0.10c; complete circles, 0.20c. Plates in width over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches, up to 130 inches, 0.50c; over 130 inches, 1.00c. Gauges under ¼ inch to and including 3-16 inch plates on thin edges, 0.10c; under 3-16 inch to and including No. 8, 0.15c; under No. 8 and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Rails and Track Material.—During the week under review the local rail mills have not taken any new business for 1907, but have booked in the neighborhood of 20,000 tons for delivery after September of the present year. Among the contracts were 5,500 tons for the Grand Trunk for use in the

United States; 10,000 tons for the Norfolk & Western; 2,100 tons for the Boise & Interurban railway; 2,500 tons for the Los Angeles & Pacific; and 1,000 tons for the American Smelting & Refining Co. Light rails are in fair demand. The demand for railroad spikes has been very heavy. We quote:

Fifty pounds and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails, 16 pounds $30, 20 pounds, $28.50; 25 to 45 pounds, $28.50; angle bars for standard sections, 1.50c; spikes, $2.05 to $2.10.

Merchant Bars.—At a meeting of the Bar Association held in Pittsburg, Tuesday of this week, all the old prices were reaffirmed, although there was a sentiment in some cases to advance. The association was firm in refusing to grant any concession whatever. No other business of importance was transacted. Bessemer steel bars are now firm at the 1.50c base. The demand for common iron bars has been light and but little new business has been done. We quote:

Common iron bars, 1.55c, Pittsburg, in carload lots, 1.60c in less than carloads; for western shipment 1.50c base Pittsburg; Bessemer steel bars, 1.50c; plow and cultivator, 1.50c net; channels, angles, zees and tees, under three inches, 1.60c, all f. o. b. Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds, of a size, 0.30c advance.

Merchant Steel.—The Bar Association has reaffirmed the old prices on steel bars at 1.50c; planished machine straightened steel tire, 1.70c and iron finished tire, 1.65c, plus half extras. For immediate shipment some producers are securing a premium. We quote:

Cold rolled and ground shafting, 50 per cent off in carload lots, and 45 off in less than carloads, delivered in base territory; tire steel, 1.70c to 1.80c; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flat, 1.50c to 1.55c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.05c to 2.10c. The price of planished and machine straightened tire is 1.70c base half extras as below. Iron finished tire up to 1½ inch by ½ inch, 1.65c base half extra tire list. Iron finished tire 1½ inch by ½ inch and over to be sold on regular bar basis of 1.50c base; half extra steel card.

Sheets.—The demand for sheets has been especially heavy during the past two weeks and producers are of the opinion that buyers are just beginning to actually appreciate the shortage of steel and are placing their business as a matter of protection and precaution. The supply of sheet bars, while it is not appreciably less, is no better than it has been and there are no indications of a betterment for several weeks to come. We quote:

Black steel sheets, box annealed, cold rolled, one pass: Nos. 11-12, 2c; Nos. 13-14, 2.05c; Nos. 15-16, 2.10c; Nos. 17-21, 2.15c; Nos. 22-24, 2.20c; Nos. 25-26, 2.25c; No. 27, 2.30c; No. 28, 2.40c. Galvanized, Nos. 10-11, 2.35c; Nos. 12-14, 2.45c; Nos. 15-16, 2.55c; Nos. 17-21, 2.70c; Nos. 22-24, 2.85c; Nos. 25-26, 3.05c; No. 27, 3.25c; No. 28, 3.45c. Corrugated roofing, $1.70 per square for No. 28 painted, 2½-inch corrugation; $3.05 per square for No. 28 galvanized, 2½-inch corrugation. Quotations f. o. b. Pittsburg on large lots.

Tin Plate.—Effective May 18, the leading producer advanced the price of tin plate 15 cents per base box and the official quotation is now $3.75, Pittsburg on 14 x 20 100-pound cokes. The reason given for the advance is the high price of pig tin in the London and New York markets and producers of tin plate made the advance as a protection against the tremendous amount of business which has been offered, if it were taken at the old price. Some little business has even been done at the $3.75 price. The last previous advance was made April 9 when the official list was advanced from $3.50 to $3.60.

We quote: $3.60 per base box, f. o. b. Pittsburg, 14 x 20 100-pound cokes, terms 30 days, less two per cent off for cash in ten days.

Merchant Pipe.—While the tonnage has been satisfactory and the assortment good, there has been no change in this market and prices remain the same as last quoted, the discount on desirable business being 81 per cent and five off.

The National Tube Co. is now prepared to supply black wrought pipe lots, $32; light rails, 16 pounds, $30; 20 merchant card and extra strong weights, plain ends or threaded, sizes one inch to three inches, in lengths up to forty feet.

We quote the official list on pipe, consumers' carloads, with jobbers' carloads one point higher discount, as follows:

	Steel		Iron	
Consumer's Carloads	Black	Galv.	Black	Galv.
⅛ and ¼ inch	71	55	67½	51½
⅜ inch	73	59	69½	55½
½ inch	75	63	71½	59½
¾ to 6 inches	79	69	76	66
7 to 12 inches	74	59	71	55½
EXTRA STRONG PLAIN ENDS.				
⅛ to ¾ inch	64	52	60½	48½
⅛ to 4 inches	71	59	67½	55½
4½ to 8 inches	67	55	63½	51½
Double extra strong plain ends, ⅛ to 8 inches	60	49	56½	45½

Boiler Tubes.—Conditions which have prevailed for several months past still continue and a concession of four points is made on the official list given below. We quote on merchant boiler tubes 22 feet and under, the official prices:

	Steel	Iron
1 to 1¼ inches	46	41
1¼ to 2¼ inches	56	41
2¼ inches	60	46
2¾ to 5 inches	66	53
6 to 13 inches	58	41

Less than carload lots two points less.
2½ inches and smaller, over 18 feet, 10 per cent net extra.
2¾ inches and larger, over 22 feet, 10 per cent net extra.

Wire and Wire Nails.—The only feature in this market is the continued strength of prices at this time of the year. While new business is light, specifications against existing contracts have been extremely heavy and demand for quick deliveries has been urgent. This is taken as an indication that the product of the mills is going directly to consumers through jobbers and stocks are light. Mills in this district have all they can handle to July 1 at least and the leading producers have not felt the letting up which is usually experienced at this time of year. The demand for wire nails and fencing is particularly heavy. We quote:

Wire nails, jobbers' carload lots, $1.85; retailers' carload lots, $1.90, and less than carload lots, $2; painted barb wire, $2 for jobbers in carloads; retailers in carloads, $2.05, and less than carloads, $2.15, with 30c for galvanizing, plain wire $1.70 to jobbers and $1.75 by carload.

Old Material.—The scrap market is softer, if anything, than it was a week ago and what buying has been done was in small lots and at low prices. The spread between scrap and pig iron is one feature in the business that is hard to account for. The big consumers are not buying, except in one instance and then the business was not of any considerable tonnage. We quote: Heavy melting stock, $15; No. 1 cast scrap, $15 to $15.50; cast borings, $8.50 to $9; bundled sheet scrap $13.50; No. 1 railroad wrought, $17; low phosphorus scrap, $18 to $18.50; wrought turnings, $11 to $11.50; bushelling scrap, $14 to $14.50; iron axles, $25.50 to $26; old steel rails, rerollers, $15.50 to $15.75.

Coke.—The Westinghouse interests during the week closed for between 10,000 and 12,000 tons of foundry coke for a year at an average of $2.65. On strictly Connellsville foundry coke for prompt delivery we quote $2.40 to $2.60 and on foundry coke $2.65 to $2.80. The estimated production of the Connellsville district for the week ending May 12 was 272,348 tons and for the lower Connellsville district, 102,080 tons.

CHICAGO.

Over a Million Tons of Rails Sold.—Pig Iron Market Dull.

Office of *The Iron Trade Review*,
1362 Monadnock Block, May 23

It is estimated that considerably over a million tons have been placed with rail mills for 1907 delivery since buying for that period commenced. The Illinois Steel Co. has about 550,000 tons on its books, the Colorado Fuel & Iron Co. 200,000 tons, and the Tennessee Coal, Iron & R. R. Co. 150,000 tons, while the Carnegie, Lackawanna and Cambria Steel companies have easily 250,000 tons divided among them. New rail tonnage this week is light, as practically all the trunk lines have contracted for their requirements or reserved the tonnage they expect to use. Apathy has also prevailed in other lines. Demand for either structural steel, plates or bars is of insignificant proportions, the only transaction of moment being the contract for 2,800 tons of structural shapes for the addition to a Milwaukee brewery, which was let to a Waukesha fabricator. The contract for 10,000 tons of cast iron pipe, on which the city of New Orleans has been figuring for some time, is reported to have been let to two Birmingham manufacturers, the Dimmick Pipe Co. securing 5,000 tons, and the American Pipe Mfg. Co. 5,000 tons. The weakness and cutting in boiler tubes continue and have extended to merchant pipe, this product now being offered on the basis of 81 per cent discount from list Pittsburg. Billets and wire rods are selling to the capacity of mills. A sale of 4,000 tons of wire rods was made this week to an eastern manufacturer on the basis of $32 Pittsburg. No change is noted in the price of sheets, although independent mills are anxious for an advance. Tin plate was moved up 15 cents a box by the American Sheet & Tin Plate Co. yesterday, making the present price $3.75 Pittsburg.

Pig Iron.—There is no life to the local market. Inquiry is very heavy and from a wide stretch of territory, but few melters are buying more than 20 per cent of the tonnage they state they are in need of. Many are content with carload lots, or just enough iron to tide them over the hot weather period. The molders' strike has had its influence in this direction, but the real cause is the firmly established belief that prices will recede to lower levels before the midsummer dullness is over. There is justification for this belief in the weakness of northern irons and the willingness of southern furnaces to sacrifice freight differentials when a desirable order is in the balance. Furnaces in the Birmingham district may be holding fast to the $14 schedule, but few stacks outside this locality are doing so. Nearly all of these are openly quoting $13.75 Birmingham for No. 2 foundry, and if this reduction does not tempt the buyer, a part or the whole of the freight differentials is preferred. A better demand than usual is felt for special irons, including those high in manganese or silicon. These grades have also shared in the softening process, and Ohio silvery, running eight to 10 per cent silicon, is being offered at $20 furnace, or $22.30 Chicago, a decline of $1 a ton. Southern silvery, four to six per cent silicon, has been bought in round lots on the basis of $14 Birmingham, or $17.90 Chicago, which is at least 50 cents a ton below the lowest price heretofore obtainable. In northern irons, malleable and standard Bessemer are the most active. Ohio furnaces are taking a large share of the local business at $18.30 Chicago, which is 20 cents a ton under the lowest Chicago price. Lake Superior charcoal is without change at $19 Chicago. We have revised our prices, and quote as follows:

Lake Superior charcoal	$19.00 to 19.25
Northern Foundry No. 1	18.80 to 19.05
Northern Foundry No. 2	18.30 to 18.55
Northern Foundry No. 3	17.80 to 18.05
Northern Scotch Foundry	18.80 to 19.05
Ohio Strong Softeners No. 1	19.80 to 20.05
Ohio Strong Softeners No. 2	19.30 to 19.55
Southern Foundry No. 1	18.15 to 18.40
Southern Foundry No. 2	17.65 to 17.90
Southern Foundry No. 3	17.15 to 17.40
Southern Foundry No. 4	16.65 to 16.90
Southern No. 1 Soft	18.15 to 18.40
Southern No. 2 Soft	17.65 to 17.90
Southern Gray Forge	16.15 to 16.40
Southern Mottled	15.90 to 16.15
Southern Silveries (4 percent to 6 percent Silicon)	17.90 to 18.15
Jackson Co. Silveries, 8 to 10 percent Silicon	22.30 to 23.30
Alabama and Georgia Car Wheel	23.90 to 24.40
Malleable Bessemer	18.30 to 18.50
Basic Iron	18.85

Merchant Steel.—Aside from the fact that there is a good demand for the products quoted below and that several season contracts have been placed with mills since our last report, there is nothing of particular interest to chronicle this week. Prices are firm and without change. Mill shipments for Chicago delivery are quoted as follows:

Spring steel, 2.10c; sleigh shoe, flat sizes, 1.71½c; concave and convex, 1.86½c; cutter shoe, 2.35c to 2.40c; smooth finished machinery steel, 1.91½c; smooth finished tire, 1.86½c base; plow steel, 2.20c and upward, according to quality; toe calk steel, 2.21c; railway spring, 1.86½c. Cold rolled shafting, 50 per cent off in carload lots and 45 per cent in less than carload lots. Crucible tool steel, 6½c to 8c; special grades of tool steel, 13c and up.

Plates.—There is an active demand for universal plates and light plates, mills having no trouble in selling all they can make of these products. Sheared plates, however, are not so strong, and early deliveries can be given by practically all makers. Jobbers report a brisk movement of material from their stocks, and at prices considered good. Quotations are without change, as follows:

Tank steel, ¼-inch and heavier, up to 100 inches wide, 1.76½c base; flange steel, 1.86½c base; marine steel, 1.96½c base; all full extras. Plates 3-16 inch thick, $2 extra; gauges, 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. We quote from local stocks; tank steel ¼ inch and heavier, up to 72 inches wide, 2c to 2.10c; 72 inches to 96 inches wide, 2.10c to 2.20c; 3-16 inch up to and including 60 inches wide, 2.10c to 2.20c; 3-16 inch 72 inches wide, 2.35c to 2.45c; No. 8, up to 60 inches wide, 2.15c to 2.25c; flange steel, 25c extra; heads, 25c extra.

Structural Steel.—The only contract of importance closed in the week under review was let to the Modern Steel Structural Co., Waukesha, for the addition to the Schlitz Brewery, Milwaukee, Wis., requiring about 2,800 tons of steel. In the aggregate, there is a good demand for the lighter sizes and shapes of structural steel from local stocks, and jobbers and fabricators have difficulty in keeping their supplies replenished. The Illinois Steel Co. is booking new tonnage for the structural mill at South Chicago, all local tonnage now being transferred to this mill for rolling. The Pennsylvania Steel Co. has closed with the Lake Shore & Michigan Southern for a few hundred tons of bridge material. Our prices are without change, and we quote carload lots, mill shipments, Chicago delivery, as follows:

Beams and channels, 3 to 15 inches, inclusive, 1.86½c; angles, 3 to 6 inches, 1.86½c; angles, larger than 6 inches, on one or both legs, 1.96½c; beams, larger than 15 inches, 1.96½c; zees, 3 inches and over, 1.86½c; tees, 3 inches and over, 1.91½c, with the usual extras for cutting to exact lengths, punching, coping, bending, or other shop work.

Quotations on lots from store are as follows: All angles three inches and larger, including six inches, $2.25 per 100 pounds base; angles over six inches, $2.35 per 100 pounds base; tees, three inches and larger, $2.30 per 100 pounds base; beams, three inches to fifteen inches, inclusive, $2.25 per 100 pounds base; beams, eighteen inches and larger, $2.35 per 100 pounds base; channels, three inches and larger, $2.25 per 100 pounds base.

Rails and Track Supplies.—New rail tonnage this week is light. The Illinois Steel Co. is practically out of the market on standard sections for 1907 delivery, and in point of tonnage booked or reserved, the Colorado Fuel

& Iron Co. is not far behind the Chicago mill. All the western trunk lines have arranged for their 1907 requirements either by contract or reservation and new inquiries are largely from trolley lines or steam roads whose requirements are not very heavy. There is a good demand also for light rails, but purchases of these are confined to this year's delivery. Sales of track supplies are heavy.

We quote, standard sections, f. o. b. mill, open-hearth rails, $29; Bessemer, $28; light rails, Bessemer steel, 30 to 45-pound sections, $27 to $28; 25-pound, $28 to $29; 20-pound, $29 to $30; 16-pound, $30 to $31; 12-pound, $31 to $32, and light sections down to 8-pound, $38 to $40, all f. o. b. mill. Track supplies are quoted as follows: angle bars, 1.50c to 1.75c; spikes (for quick shipment), 2.15c to 2.25c; (for forward deliveries) 2.05c to 2.10c; track bolts, 2.65c to 2.75c base square nuts.

Merchant Pipe.—The consumption of pipe is without noticeable diminution, specifications keeping up their past active proportions. New tonnage, however, is not so strong, although the dullness is considered seasonable. Values are well maintained on the following basis: ¾ to 6-inch black steel pipe, 78.35 per cent discount from list, and galvanized 68.35 per cent discount. Minimum quotations of jobbers are 76½ to 77 per cent discount on the base sizes ¾ to 6-inch black steel pipe.

Boiler Tubes.—The low prices that are being quoted have stimulated demand and consumers are contracting quite freely. Competition is still keen and attractive prices are named on desirable business. The following quotations fairly represent current values, although they are occasionally changed to meet special conditions:

	Steel	Iron	Seamless
1 to 1¼ inches	46.35	43.35	53.35
1¼ to 2¼ inches	58.35	43.35	40.35
2½ inches	60.35	48.35	43.35
2¼ to 3 inches	68.35	55.35	
2¼ to 4½ inches (Seamless)			50.85
6 to 13 inches	58.35	43.35	

Less than carload lots, from store, as follows:

	Steel	Iron	Seamless Steel
1 to 1¼ inches inclusive	40	35	42½
1¼ to 2¼ inches, inclusive	50	35	35
2½ inches, inclusive	52½	35	30
2¼ to 5 inches, inclusive	60	47½	42½

Cast Iron Pipe.—It is reported here that the contract for 10,000 tons of pipe has been let by the city of New Orleans, La., Birmingham (Ala.) interests getting the entire tonnage. The Dimmick Pipe Co. is credited with securing 4,000 tons of this order, and the American Pipe Mfg. Co., the balance. The market is very strong, and some talk is indulged in of an early advance. We quote 4-inch water pipe, $31 Chicago; 6, 8, 10 and 12-inch, $30; larger sizes, $29.50; gas pipe, $1 extra.

Billets and Rods.—Orders for semi-finished material are hard to place for the reason that mills have little surplus capacity for sale. Only one mill in the West is offering forging billets for outside consumption, and for these it is asking a minimum of $35 Chicago. There is a brisk demand for wire rods, one lot of 4,000 tons having been sold to an eastern consumer on the basis of $32 Pittsburg. For smaller lots, however, the market is strong at $33 Pittsburg, or $36 Chicago.

Iron and Steel Bars.—The local market is apathetic, so far as new tonnage for iron or steel bars is concerned. Specifications continue active, the consumption in all subsidiary lines being exceedingly strong. Bar iron mills are somewhat uneasy over the scarcity of new tonnage for last half deliveries, and to stimulate inquiry in this direction one eastern factor is quoting to western consumers about 50 cents a ton below the local price. This competition has not been met by producers in this territory, however, all these standing firmly on the quotation of 1.66½c Chicago. Other prices are without change, as follows, carload lots, Chicago delivery, being the basis.

Soft steel bars and bands, 1.66½c half extras; soft steel angles, less than 3 x 3, 1.76½c; hoops, 2.06½c base, full extras; old rail stock, 1.65½c. Jobbers report a good demand from stock, with prices firm. We quote bar iron, 2.10c full extras; soft steel rounds and squares, 3 inches and larger, $2 per 100 pounds base; flats, 2 inches to 4 inches by 1⅛-inch and larger, $2 per 100 pounds base; flats, 2 inches to 4 inches by 1⅛ inch and larger, $2 per 100 pounds base; flats, 4½ inches x 5 inches and 6 inches x 5-16 inch and thicker, $2 per 100 pounds base; all ovals, half rounds, $2 per 100 pounds base; steel bands, $1.85 to $1.95 half extras; soft steel hoops, $2.30 to $2.40 full extras. Other sizes not mentioned above, $1.85 per 100 pounds base, plus half extras.

Sheets.—Sheets remain one of the strongest features of the local market. Not for two or three years past have values been so uniformly maintained as at the present time. The distribution is continually to the full capacity of mills and there are no signs of any change. The demand is especially strong for galvanized sheets and corrugated roofing, on which mills cannot give deliveries within 60 to 90 days. Large shipments of these materials continue to be made to San Francisco, local stocks being greatly depleted by this demand. The strength and scarcity of sheet bars, and the advances this week in tin plate and zinc, amounting to 15c per box for the former and 10c per 100 pounds for the latter, and the generally tightly sold condition of mills on both black and galvanized sheets, has strengthened the possibility of an advance in these products at an early date. Several independent makers are known to be in favor of such a move. We quote mill shipments, Chicago delivery, as follows:

Nos. 8, 9 and 10, 1.86½c; Nos. 11 and 12, 1.91½c; Nos. 13 and 14, 1.96½c; Nos. 15 and 16, 2.06½c. Box annealed, Nos. 18 and 20, 2.26½c; Nos. 22 and 24, 2.36½c; No. 26, 2.41½c; No. 27, 2.46½c; No. 28, 2.56½c; No. 29, 2.71½c; No. 30, 2.81½c. Jobbers' prices on less than carload lots are as follows: No. 10, 2.20c; No. 12, 2.25c; No. 14, 2.30c; No. 16, 2.40c; Nos. 18 and 20, 2.55c; Nos. 22 and 24, 2.60c; No. 26, 2.65c; No. 27, 2.70c; No. 28, 2.75c; No. 30, 3.20c.

Quotations on galvanized sheets, carload lots, mill shipments, are as follows: Nos. 10 and 11, 2.46½c to 2.51½c; Nos. 17-21, 2.81½c to 2.86½c; Nos. 22-24, 2.96½c to 3.01½c; Nos. 25-26, 3.16½c to 3.21½c; No. 27, 3.36½c to 3.41½c; No. 28, 3.56½c to 3.61½c; No. 29, 3.81½c to 3.86½c; No. 30, 4.06½c to 4.11½c. From store, galvanized sheets, less than carload lots, are quoted as follows: No. 10 to 20, 3c to 3.10c; Nos. 22 and 24, 3.15c to 3.25c; No. 26, 3.35c to 3.45c; No. 27, 3.55c to 3.65c; No. 28, 3.75c to 3.85c; No. 30, 4.95c to 5c.

Wire Products.—An exceptionally strong demand exists for all forms of wire material. Large shipments continue to be made to the Pacific Coast, the consignments of one interest aggregating not less than 10,000 tons weekly. Stocks in dealers' hands are low and urgent requests are constantly made on mills for prompt shipments. Very little tonnage has been accumulated by mills, and unless the demand ceases somewhat during the summer months, the volume of fall business will be seriously retarded. Prices are firm and without change, carload lots to jobbers, Chicago delivery, being quoted as follows:

Wire nails, $2; painted barbed wire $2.15; galvanized barbed wire, $2.45; smooth annealed wire, $1.85; smooth galvanized wire, $2.15; polished staples, $2.15; galvanized staples, $2.40. Carload lots to retailers, 5 cents higher than above prices; less than carload lots, 15 cents higher.

Coke.—The market is still in a ragged condition. Demurrage coke has been plentiful all week, but local tracks are pretty well cleaned up now. Wise county coke is offered at $4.75 to $5 Chicago, and Connellsville brands at

about 25 cents a ton higher. Solvay coke is quoted at $5.40 to $5.65.

Old Material.—Speculation is strong among local dealers. So far it has not resulted in any benefit to the market. Consumers are slow to purchase and usually require some inducement in the way of an attractive price before they will place an order. Material is plentiful in the hands of both dealers and consumers, and the possibility of a strong market during the summer months is very remote. The C. B. & Q. R. R. has a new list out this week for 4,000 tons. We have revised our prices, with quote gross tons in the first paragraph as follows:

Old Steel Rails (4 feet and over)	$16.00 to 16.50
Old Steel Rails (less than 4 feet)	14.50 to 15.00
Old Car Wheels	19.00 to 19.50
Old Iron Rails	21.00 to 21.50
Relaying Rails, subject to inspection	27.00 to 27.50
Heavy Melting Steel	14.00 to 14.50
Mixed Country Steel	11.50 to 12.00

We quote as follows net tons:

No. 1 R. R. Wrought	$14.50 to 15.00
No. 2 R. R. Wrought	13.50 to 14.00
Shafting	16.00 to 16.50
Dealers' Forge No. 1	12.50 to 13.00
Wrought Pipe and Flues	10.50 to 10.75
No. 1 Cast, 150 pounds and less	13.50 to 14.00
No 1 Mill	9.00 to 9.50
Mixed Busheling (No. 1 & No. 2)	10.00 to 10.50
Country Sheet	8.00 to 8.50
No. 1 Boilers Cut	10.00 to 10.50
Boiler Punchings	12.00 to 12.50
Iron Car Axles	23.00 to 23.50
Steel Car Axles	18.50 to 19.00
Iron Axle Turnings	10.50 to 11.00
Cast Borings	8.50 to 9.00
Mixed Borings, etc	8.50 to 9.00
Machine Shop Turnings	10.25 to 10.75
Railroad Malleable	13.50 to 14.00
Agricultural Malleable	12.50 to 13.00
Stove Plate and Light Cast Scrap	11.00 to 11.50
Old Iron Splice Bars	16.50 to 17.00

CLEVELAND.

Sales and Inquiries for Pig Iron Numerous.—Corporation is Negotiating.

OFFICE OF *The Iron Trade Review*,
BROWNING BUILDING, May 22.

Iron Ore.—The congestion at lower lake ports due to the ten days' strike of longshoremen has been almost entirely relieved and fleets are moving freely. Demands of the marine firemen, boiler and water tenders have yet to be settled, but no trouble is expected in this direction and the outlook is for an extremely busy season free from labor difficulties. The shipment of ore is proceeding without incident at an enormous rate, and statistics for May will show an immense movement, despite the ten days' idleness. Noteworthy in connection with lake navigation is the announcement by President Wallace of the American Ship Building Co. that within a short time his company will contract to build a steamer from 640 to 645 feet in length over all, with a capacity of 14,000 tons of iron ore on a draught of 19 feet. No recent sales of ore are reported, and the price continues unchanged on the basis of $4.25 old range Bessemer.

Pig Iron.—Sales of 5,000 tons and 2,000 tons of basic at $17.00, valley, are reported in this district. The price is firm at this figure. Cleveland interests have sold scattered lots aggregating 13,000 tons in the Buffalo district, and inquiries, mostly for small lots which total about 15,000 tons, are pending locally. Foundry iron is selling freely as low as $16.25, valley, and probably $16.00 is being done on desirable business, with the Cleveland price $16.50 for No. 2. Inquiry in this line is good and the settlement of foundry labor troubles insures its continuance. It is hard to account for the recent slump in foundry prices, as consumption in this district is fully equal to the make. The low prices have resulted in certain interests practically retiring from the market. Bessemer is in brisk demand with the price firm at $17.25 and an occasional sale above that figure. The corporation is negotiating with the Bessemer Association for 20,000 tons for June and July, and it is understood independent interests are in the market for 30,000 tons. The demand for spot coke is light, but the contract business is fairly brisk with prices at $2.50 for furnace coke and $2.85 to $3.00 for foundry. We quote Cleveland delivery as follows:

Bessemer	$18.10 to 18.35
No. 1 Foundry	17.25 to 17.50
No. 2 Foundry	16.75
No. 3 Foundry	16.25 to 16.50
No. 2 Southern	17.85 to 18.10
Gray Forge	16.35 to 16.85
Gray Forge, Southern	15.85 to 16.35
Lake Superior charcoal	19.50 to 20.00

Finished Materials.—The brisk demand for sheets and their scarcity continue to be the feature of the market. Mills are from six to twelve weeks behind in deliveries and an advance is generally predicted, as there is no prospect of the sheet bar supply improving. In other lines the market has eased considerably. Forging billets, which recently sold as high as $35 Pittsburg, are now selling locally at about $33 Pittsburg, and are readily obtainable. Less premium business is being done in structural materials. A fair demand is noted in plates, but deliveries are prompt. Iron bars are selling readily and are firm at 1.50c Pittsburg, plus freight to destination, and occasionally a higher price is reported. The nut and bolt manufacturers at their recent meeting reaffirmed the old scale of prices.

Old Materials.—The market continues exceedingly dull and business is confined exclusively to trading among dealers. Small declines are noted in a number of items. We quote f. o. b. Cleveland, as follows:

Old iron rails	$20.00 to 21.00
Old steel rails (over 6 feet)	16.50 to 17.00
Old steel rails (under 6 feet)	16.50 to 17.50
Old car wheels	16.50 to 16.75
Steel boiler plate	12.00 to 13.00
Steel axles	19.00 to 20.00
Malleable iron (railroad)	15.00 to 15.50
Malleable iron (agricultural)	13.00 to 13.50
Heavy steel	14.50 to 15.00
Country mixed steel	13.00 to 13.50

We quote net tons, as follows:

No. 1 R. R. wrought	15.50 to 16.00
No. 1 busheling	12.00 to 12.50
No. 1 machine cast	13.25 to 13.75
Iron axles	22.00 to 23.00
Axle turnings	11.00 to 12.00
Wrought turnings (free from cast)	9.00 to 9.50
Grate bars	10.00 to 10.50
Pipes and flues	11.50 to 12.00
Tank iron	10.50 to 11.00
Hoop and band iron	7.50 to 8.00
Sheet iron	6.50 to 7.00
Wrought drillings	9.00 to 9.50
Stove plate	10.00 to 10.50
Cast borings	7.00 to 7.50

CINCINNATI.

Most Important Inquiry Comes from a Northern Ohio Melter.

May 22.

Pig Iron.—The market in a general way has continued quiet the past week and sales have been few. The most notable inquiry comes from a melter in northern Ohio for 12,000 tons. It is expected that the bulk of this business will go to northern furnaces, as the present prices of southern iron for this delivery are much higher than can be done by valley furnaces. It is also expected that the southern iron will sell by analysis instead of grade, so that it will be difficult to determine the price level from this transaction. Southern irons are quoted mainly at $13.75 to $14.00 Birmingham for No. 2 foundry with a very exceptional quotation of $13.50 coming to light. Northern iron appears to be steady at $16.00 at furnace. Virginia basic is quoted at $16.00 to $16.25, Virginia furnace. Valley basic at $17.00 furnace. The situation shows no particular change from the recent past and the general run of foundry iron buyers show but little interest in the market. Sellers are not urgently seeking orders at concessions, although all inquiries bring out efforts to secure the order, but without any sacrifice in values. The widening out of the recent agreement of southern furnaces, which now includes four additional companies as well as the largest producers of the Birmingham district, has had the effect of bringing the southern iron market closer to the $14.00 basis. We give below a list of representative inquiries and sales which serve as a reflection of the market:

SALES.

1,000 tons southern gray forge to an Ohio point at private terms.

500 tons malleable iron, third quarter delivery, at $16.00 Hanging Rock district.

500 tons of foundry iron for the next two months' delivery on basis of $16.00 northern furnace.

300 tons charcoal iron at $21.05 Pittsburg, or $18.25 at furnace.

1,400 tons of foundry iron in St. Louis territory at private terms.

500 tons high silicon iron last half delivery to an Ohio point.

673 tons of basic to an Ohio melter.

300 tons of ferro-silicon (50 per cent) at $95.00 Pittsburg.

500 tons southern foundry, last half delivery, to a northern Ohio point.

500 tons Virginia foundry.

1,200 tons northern No. 2 foundry to a point in Ohio, last half delivery, at $16.00 furnace.

INQUIRIES.

An Ohio melter wants 1,000 tons of foundry iron.

A car builder wants 5,000 tons of foundry iron in St. Louis territory.

A melter in northern Ohio is figuring on 12,000 tons, of Nos. 2, 3, & 4 foundry.

A large melter in Ohio is in the market for from 4,000 to 5,000 tons foundry.

Quotations f. o. b. Cincinnati are as follows:

Southern Foundry No. 1	$17.25 to 17.50
Southern Foundry No. 2	16.75 to 17.00
Southern Foundry No. 3	16.25 to 16.50
Southern Foundry No. 4	15.75 to 16.00
Southern Foundry No. 1, soft	17.25 to 17.50
Southern Foundry No. 2, soft	16.75 to 17.00
Gray Forge	14.75 to 15.00
Northern Foundry No. 1	17.65 to 18.15
Northern Foundry No. 2	17.15 to 17.65
Northern Foundry No. 3	16.65 to 17.15
Jackson County Silvery, 8 per cent	21.15 to 21.65
Southern Charcoal	22.75 to 23.25

Finished Material.—The demand continues moderately active and the market is steady and unchanged. Bar iron, while not quotably changed, is dull, and there is some irregularity in prices.

We quote: bars at 1.63c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets, No. 10 and No. 12, in car lots are 2.58c. We quote black sheets, No. 27 at 2.40c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.85c; No. 27, 2.75c; No. 16, 2.35c; No. 14, 2.25c; No. 12, 2.15c. Tank plates are firm and sell out of store at 2c to 2.10c for ¼-inch and 2.10c for 3-16, Nos. 8 and 10. Beams and channels are quoted at 2.25c to 2.35c from stock and angles at 2.10c to 2.15c for base sizes.

In merchant pipe there is a stronger undertone to the market, but no quotable change in prices. We quote f. o. b. Cincinnati.

MERCHANT PIPE.
(Basing Discounts)

	Steel Pipe		Guaranteed Wrought Iron Pipe	
	Black Per cent	Galv. Per cent	Black Per cent	Galv. Per cent
⅛ and ¼ inches	69.7	52.7	....	....
⅜ inch	73.5	61.3	....	....
½ inch	73.7	61.7	....	....
¾ to 6 inches	77.7	67.7	....	....
7 to 12 inches	72.7	57.7	....	....

Coke.—The market rules easy without much inquiry. Prices for foundry coke are lower. Furnace coke is quiet and many of the southern furnace interests are covered for the second half of the year. Northern furnaces have yet to place their contracts, but are not inquiring as yet for their supplies. Prices in the various producing districts are as follows:

Wise County, Va. Furnace Coke prompt shipment	$2.50 per ton
Wise County, Va. Foundry Coke prompt shipment	2.75 to 3.00 per ton
Pocahontas Furnace Coke prompt shipment	$2.25 to 2.50 per ton
Pocahontas Foundry Coke on contracts	2.75 to 3.00 per ton
Connellsville Furnace Coke prompt shipment	2.50 per ton
Connellsville Foundry Coke prompt shipment	2.75 to 2.90 per ton
New River Foundry Coke on contracts or prompt shipment	2.75 to 3.00 per ton
New River Furnace Coke, prompt shipment	2.50 per ton

†Wise County, Va., Coke on Furnace contracts is sold mainly on a sliding scale basis for pig iron prices on the following basis: $1.65 per ton on $9.00 pig iron, plus 17 per cent of the advance on pig iron above $9.00 Birmingham

Old Material.—The market rules quiet but there is a good undertone prevailing. Railroads are submitting only a few lists and these are withdrawn unless prices are satisfactory. The demand from mills is fair. We quote f. o. b. Cincinnati as follows:

Old No. 1 railroad wrought, net tons	$14.00 to 14.50
Cast machine and foundry, net tons	12.50 to 13.00
Old iron rails, gross tons	20.00 to 20.50
Old steel rails, gross tons	15.50 to 16.00
Old short lengths, gross tons	16.00 to 17.00
Old iron axles, net tons	22.00 to 23.00
Heavy melting scrap, gross ton	15.00 to 15.50
Stove plate, net tons	10.00 to 10.50
Wrought turnings, net tons	9.50 to 10.00
Cast borings, net tons	7.00 to 7.50
Car wheels, net tons	16.00 to 16.50

Claude C. Hayward, formerly with the Tennessee Coal, Iron & Ry. Co., Cincinnati office, and for a long time with Matthew Addy & Co., has gone with Walter Wallingford & Co., and will travel for them from Cincinnati.

The Cincinnati offices of the Republic Iron & Steel Co., and the Tennessee Coal & Ry. Co., will remove this week to the First National Bank building.

NEW YORK.

Molders' Strike Destroys Interest in Foundry Iron.—Prices Hold Firm, But No Snap in the Market.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., May 21

Pig Iron.—While there has been a fair movement of supplies in regular channels, the pig iron market has been without special activity or excitement. Prices are firm and there have been few concessions except on off lots which could not be turned to the best class of work. The molders' strike, which has during the week spread through parts of New Jersey and the Hudson river valley, has had an unfavorable effect upon business, but this is expected to be of short duration. In New England, where the labor troubles appear to have been the worst, it is difficult to interest any one in the market. In and about Boston the strikers have been unusually determined. Nine large foundries are suffering more or less inconvenience, but no one anticipates a long siege. In all some 7,000 men are out and it is reported that the strike fund did not exceed $50,000, which will not sustain a long campaign. In the local market sales have been practically confined to foundry grades. Little if any of the heavy business in steel and iron of the week was consummated in New York, and the same is true of the purchases of iron for pipe foundries which have been reported. The most important sales were some 7,000 tons of various grades to the General Electric Co. and 2,000 tons of special analysis iron for the International Pump Co. The remaining tonnage was divided into small lots of from 100 to 500 tons each. There was one sale of No. 2 Virginia, 500 tons to be delivered in eastern Pennsylvania and 200 tons of southern charcoal iron. On the whole, although sales to regular customers for early delivery have been numerous, the total was considerably below current consumption, which is admitted to be large in spite of cold cupolas due to labor difficulties. Coke is quiet and is recovering slowly from coal strike excitement and its inevitable reaction. Ferro-manganese is little in evidence and prices are more nominal than actual.

Northern No. 1 Foundry	$18.25 to 19.00
No. 2 Foundry	17.75 to 18.50
No. 2 Plain	17.50 to 18.00
No. 1 Southern Foundry	18.00 to 18.50
No. 2 Southern Foundry	17.50 to 18.00
No. 3 Southern Foundry	16.75 to 17.25
No. 4 Foundry	16.50 to 17.00

Certificates and Warrants.—The market has been dull with few offerings and little interest. There is apparently no desire to speculate in iron and very little iron in the yards available for the purpose. The only sales of the week were 100 tons of regular for October delivery at $16.25, and 100 tons of the same designation for shipment in July at $16.70. The following are today's quotations for standard foundry contracts.

Standard Foundry Contracts.

	Bid.	Asked.
May	17.10	17.50
June	17.10	17.50
July	17.25	17.65
October	....	17.40

Finished Iron and Steel.—Interest in the steel trade is centered in the activity among the railroads to secure a good position and tonnage on the rail manufacturers' books for future needs. Negotiations for 1907 delivery are on in all directions and it is reported that the mill capacity for the present year has been oversold to such an extent that several hundred thousand tons must be added to the 1907 output. The market for structural material has been quiet with practically no new bridge work for the railroads. In the building field there is also an influence at work which prolongs the hold up of plans. Whether this factor is wholly financial or at least partially industrial has not been determined. Apprehension in regard to the attitude of labor is no longer a controlling influence, for employes are now sufficient in number

and the definite stand taken by the erectors' association seems to have eliminated that difficulty effectually. The only orders of considerable magnitude placed during the week were the following secured by the American Bridge Co.: 1,000 tons for a new shop for the National Cable & Conduit Co., at Hastings, N. Y.; 1,600 tons for filters to be constructed in Pittsburg; and 700 tons for a store and office building to be erected on Fifth avenue, New York. The number of projects on foot ensures another rush of business sooner or later. The city commissioner of bridges has approved a plan for connecting the two Brooklyn bridges by means of an elevated structure. The Manhattan bridge contract is still entangled in the legal web. It is now apparent that the great demand for steel in San Francisco must be long delayed. A month has now passed since the disaster and not a single order has yet materialized and contracts which had been placed before the destruction occurred are still held up. Plans cannot be begun until the authorities decide whether the street outlines are to be altered or not, after which it will require weeks to prepare foundations, etc. In the plate market there has been a good run of usual orders and the demand for bars has been fair. The sudden drop in the price of pig tin will tend to allay the excitement in the plate industry.

The following are prices at tidewater: Angles, 3 to 6 inches x ¼ inch and heavier, 1.84½c; beams, 3 to 15 inches, 1.84¼c; tees, 3 x ¼ inch and heavier, 1.89½c; plates, carloads, tank, 1.74½c; flange, 1.84½c; marine boiler, 2.41½c; refined iron bars, 1.64½c to 1.74½c; soft steel bars, 1.64½c; sheets, No. 28 black, 2.40c.

Old Material.—The demand has suddenly fallen off although prices remain about the same. Steel scrap has shown the greatest activity and railroad wrought the least. The demand for heavy cast has been fair. Sales of heavy melting steel during the week aggregate about 800 tons and of heavy cast and railroad wrought about 300 tons each. The following are prices approximately f. o. b. tidewater:

Old iron rails	$21.00 to 22.00
Old steel rails, long lengths	15.00 to 15.50
Old steel rails, short pieces	14.50 to 14.75
Relaying rails	24.00 to 25.00
Old car wheels	17.00 to 18.00
Old iron car axles	26.00 to 27.00
Old steel car axles	19.00 to 19.50
Heavy melting steel scrap	15.00 to 15.50
No. 1 railroad wrought scrap	17.50 to 18.50
Iron track scrap	17.00 to 17.50
Wrought pipe	12.50 to 13.50
Cast borings	9.50 to 10.00
Wrought turnings	13.00 to 13.50

Andrew Carnegie and Mrs. Carnegie sailed from New York on the White Star steamship Celtic for their summer residence in Scotland.

PHILADELPHIA.

Some Heavy Business Pending and the Market is Strong and Firm.

May 21.

Pig Iron.—Little change is to be noted from last week. There are several large orders, running as high as 10,000 tons, hanging over the market, but they have not been placed and in the meantime most of the buying is for June and July delivery. As many of the furnaces are already far behind in their deliveries, this new business promises to give them all they can do for the next two or three months, and neither they nor the consumers are inclined to commit themselves very deeply for the fourth quarter. The result is a strong, steady market, with no shading in prices for the immediate future. Rather than lose old customers, who are willing now to place orders for the balance of the year, some producers are willing to make slight concessions, but this is not general, and in many cases the outer range of prices is being obtained. The strike of the molders, while not affecting any local industries, is expected to have an effect on foundry irons, if continued much longer. Prices may be quoted as follows:

No 1X Foundry	$19.00 to 19.50
No. 2X Foundry	18.50 to 19.00
No. 2 Plain	18.00 to 18.50
Standard Gray Forge	16.50 to 16.75
Basic	17.50 to 17.90
Low Phosphorus	25.00 to 25.50
Southern No. 2X rail	18.75 to 19.00

New Material.—Advices from the mills are generally satisfactory. Bar iron is reported in somewhat better demand, and there is no diminution in the activity of those establishments engaged on plates and structural material. Prices remain unchanged as follows:

Beams, channels and angles according to specifications, 1.83½c to 2c; refined iron bars, 1.63½c to 1.73½c; steel bars, 1.63½c to 1.73½c; plates, 1.73½c to 1.83½c.

Old Material.—The weakness noted last weak still continues, and prices in many lines have fallen still lower. The steel mills have done some buying, but the iron mills are reported to be stocked up and claim that they can go until August without more purchases. While there has been little doing on which to base quotations prices may be quoted about as follows:

Old steel rails	$16.50 to 16.75
No. 1 steel scrap	16.50 to 16.75
Old steel axles	19.75 to 20.50
Old iron axles	25.00 to 25.50
Old iron rails	21.00 to 21.50
Old car wheels	16.00 to 16.75
Choice scrap, R. R. No. 1 wrought	19.00 to 19.50
No. 1 yard scrap	16.50 to 17.50
Machinery scrap	15.50 to 16.00
Low phosphorus scrap	20.00 to 20.50
Wrought iron pipe	13.75 to 14.25
No. 1 forge fire scrap	14.50 to 15.00
No. 2 forge fire scrap, ordinary	10.00 to 10.50
Wrought turnings	12.50 to 13.00
Axle turnings, heavy	13.50 to 14.00
Cast borings	9.50 to 10.00
Stove plates	11.50 to 12.00

ST. LOUIS.

Pig Iron Dull.—Strong Demand for Structural Material.

May 21.

It was a dull week in the pig iron market. There was very little demand except some small lots for immediate consumption. The price did not suffer any further decline. One Chicago foundry bought 300 tons southern foundry through St. Louis and the American Car & Foundry Co. is in the market for 1,000 tons, but there are few inquiries of any consequence. An inquiry for 5,000 tons basic apparently has gone over indefinitely.

There is a growing demand for charcoal iron, which seems to be particularly hard to get. A big foundry has approached a local agent with an inquiry for 500 or 600 tons a month for four or five months. Charcoal iron is selling at $22 in this market. Iron quotations are still rather ragged, with $14 Birmingham the top price. Orders are generally closed 25 to 35 cents below this figure.

There is little activity in coke. Prices run from $2.70 for furnace to $3.25 for foundry grades at Connellsville.

Iron quotations, including the freight rate of $3.50 to East St. Louis, range as follows:

Southern No. 1	$17.75 to 18.25
Southern No. 2	17.25 to 17.75
Southern No. 3	16.75 to 17.25
Southern No. 4	16.50 to 17.00
Gray Forge	16.25 to 16.75

Finished Material:—In strong contrast with the weak market for pig iron is the market for building shapes, structural material, spikes, nails, etc., which continue in great demand. There were no contracts for large office buildings let the past week, but specifications are expected to be out for some more soon. There has been a hitch in the negotiations for leases for the extension of the Bank of Commerce building, eighteen stories tall, to extend over the whole block on Broadway, Pine to Olive. All the plans are prepared and the contract for the steel, 2,500 tons, will be let as soon as this difficulty has been cleared away. Brown-Ketcham have secured the contract for the steel, 300 tons, for the extension of the M. K. & T. shops at Parsons, Kan. The contract for the new Y. M. C. A. office building opposite Union Station has been let to the James Stewart Construction Co., and the specifications for the steel, 400 to 500 tons, will be given out Saturday.

A record was set at Conneaut May 21 when the steamer J. G. Butler, carrying 9,356 tons of ore, was unloaded in three hours and 45 minutes. Four Hulett and

four electric Browns handled the ore. The best previous time, it is stated, was made on the Gary last summer, the record being three hours and 51 minutes.

Metal Market

NEW YORK.

May 22.

Pig Tin.—Prices have tumbled like a balloon deprived of gas. In two days the market lost all it had gained in three weeks, for in one week the drop in the price of tin has been eight cents per pound. Today following the decline the metal closed weak and unsettled. The following are today's quotations: Spot, 40 to 41; May, 39 to 40; June, 38 to 39; London, £184 and £178; arrivals for the month to date, 1,907 tons; afloat, 2,458 tons.

Copper.—The market is quiet and unchanged. Today's quotations follow: Lake, 18¾ to 18⅞; electrolytic, 18⅜ to 18⅝; casting, 18¼ to 18⅜; London's closing today: £84 12s 6d and £84. Exports for the month to date, 11,035.

Lead.—The market has ruled strong with a good demand. Today's closings, 5.95 to 6.00; St. Louis, 5.85 to 5.90; London, £16 17s 6d.

Spelter.—The demand has been moderate and the market is weak. Today's closings, 5.90 to 6.00; St. Louis, 5.80; London, £26 17s 6d.

Antimony.—The local market is quiet and unchanged. Today's quotations, Cookson's and Hallett's 25 to 26; other grades, 24½ to 25½.

ST. LOUIS.

May 21.

The presistent efforts of the trust buyers to force the price of zinc ore down in the Missouri-Kansas field has had its effect. Those operators who have held for the top price accumulating stocks, the buyers pouncing in on those where the price is cut. A result is seen in the decline of spelter from $5.90 to $5.80. The price is nominal and the market is dull.

Lead continues firm and active demand, some orders being carried over. The metal is scarce. Five ninety is being offered for Missouri brands, an advance of 5 cents, but it is being held firm at $6.

Enters New Quarters.—The American Can Co., having outgrown its offices on the seventh and eighth floors of the Bowling Green Building, removed on May 1 to its new, eight-story steel frame building at No. 447 West Fourteenth street, New York city. This structure, fronting on Fourteenth street, and extending through the block to Fifteenth street, is the largest building in the country devoted exclusively to the manufacture of tin cans. The basement and first five floors are devoted to manufacturing.

LATE RAIL SALES.

(Special Telegram.)

New York, N. Y., May 23.—The following rail sales for 1906 delivery are announced: Ches. & Ohio, 15,000; Toledo, Peoria & Western, 2,200; scattering orders, 4,000 or 5,000. The Baltimore & Ohio is negotiating for 50,000 tons for 1907, and southern and western roads for 400,000 more. Thirty five hundred tons of export rails were shipped from here to South America this week.

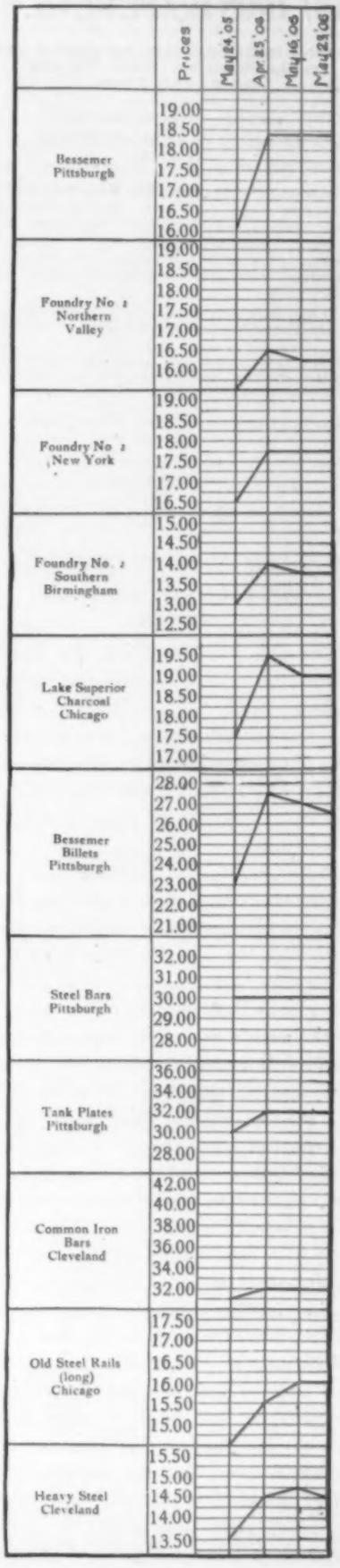
MAY BUILD AT MADISON.

The American Car & Foundry Co. has been delayed in starting work on its new million-dollar plant in South St. Louis through dilatory tactics practiced by the house of delegates of St. Louis. The company has acquired property, but cannot build until it has acquired terminal privileges over Louisa and Lynch streets. A bill granting this permission has been passed by the city council, but is being "nursed" in a house committee. Scott H. Blewett, general agent of the company, is authority for the statement that the company will build its plant in Madison, Ill., unless the house takes speedy action. The plant will be the largest in this section and will give employment to 7,000 men.

New Southern Association.—Advices from the south of a reliable character state that a new southern pig iron association has been formed. The recent agreement between the Republic Iron & Steel Co., the Sloss-Sheffield Steel & Iron Co. and the Tennessee Coal, Iron & railway Co. served as a nucleus and to these companies have been added the Lacey Buck Iron Co., The Roane Iron Co., The Citico Furnace Co., and the Chattanooga Iron & Coal Co. It is understood that these interests are now in the agreement to maintain the $14.00 basis recently announced by the large Birmingham interests.

A New Magazine.—The first issue of *The Selling Magazine*, a monthly devoted to the marketing of machinery, tools, equipment and supplies has appeared, with Emerson J. Harris, as publisher, John A. Kirchoff, managing editor, and Walter D. Gregory manager. These gentlemen have had valuable experience which equips them for editing and publishing a journal of great service in its chosen field. The initial number abounds in excellent articles of a practical nature and in the advertising department leading technical publications are represented.

PRICE CHART.



THE IRON TRADE REVIEW

Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades.

PUBLISHED EVERY THURSDAY BY
THE PENTON PUBLISHING CO.
CLEVELAND

CHICAGO - - 1164 Monadnock Block
PITTSBURG - - - 521 Park Building
NEW YORK - - - 150 Nassau St.

Subscription, $3.00 per annum. To Foreign Countries, $4.50. Advertising Rates Furnished on Application.

Change of advertising copy must reach this office ten days preceding date of publication.

The Cleveland News Co., will supply THE IRON TRADE REVIEW through the regular channels of the American News Co.

ENTERED AT THE POST OFFICE AT CLEVELAND, AS SECOND CLASS MATTER

PRINTED IN AN OPEN SHOP

May 24, 1906

WORLD'S IRON PRODUCTION DOUBLED IN FIFTEEN YEARS.

Statistics, provisional in a few cases, but final in most, have been made public covering more than 90 per cent of the world's production of pig iron in 1905. The only countries making more than a million tons a year for which 1905 statistics are now lacking are Russia and Austria-Hungary.

Using statistics for previous years in the case of countries for which 1905 figures are not available, it appears that the production last year was about 53,700,000 gross tons. This total is certainly not in error by as much as half a million tons.

The world's production of pig iron has doubled in a decade and a half. The accompanying table gives the production by five-year periods from 1890. The statistics of all countries except the United States, Canada and Great Britain are originally presented in metric tons of 2,204.6 pounds, and in all cases these figures have been reduced to gross tons of 2,240 pounds in order to make up the table.

The world's production in 1890 was 26,980,810 gross tons, and in 1905 53,696,008 tons, so that production practically doubled, the gain being 26,715,198 tons, or 99 per cent. The rate of increase was not altogether uniform. In order to make a total gain of 99 per cent in the 15 years, there should be an increase in each five-year period of 25.8 per cent, if the increase were uniform. The gain of 1895 over 1890 was, however, but 6.2 per cent; the gain of 1900 over 1895 was 40.3 per cent and the gain of 1905 over 1900 was 33.5 per cent. The depression which started in 1893 and suddenly ended in 1899 largely accounts for this irregularity.

The increase in production is far from uniformly distributed over the different iron producing countries. Italy and Japan have become producers since 1890. Canada made only 19,439 tons in 1890, and now makes nearly half a million tons. These gains, while large in proportion, are not large in point of tonnage.

All things considered, Russia has made the best showing of all, having more than tripled its production in the 14 years to 1904, statistics for last year not being available. The point has not been reached with Russia where there is the slightest sign of any exhaustion of its mineral resources. The country has everything to gain and nothing to lose.

The United States and Germany have run quite evenly, the United States increasing its production in the 15 years by 149.8 per cent and Germany by 147.0 per cent.. In 1890 these two countries made 51.1 per cent of the world's pig iron; of the total increase in 15 years they furnished 74.9 per cent, so that in 1905 they made 63.0 per cent of the world's total.

To put it in round figures, in 1890 the United States and Germany made one-half of the world's pig iron; while the world's production doubled in 15 years, their own production increased one and a half times, and in 1905 they made five-eighths of the world's total.

Several causes contributed to this good showing. Both countries have a particular spirit of progressiveness, the population of both is growing rapidly, and both are well provided with natural resources. Their future is particularly bright. Germany has an almost inexhaustible supply of iron ore in the Minette district. The United States has much purer ores in the Lake Superior region, and while they are not as extensive as the Minette ores, there are various other deposits which will supplement them.

The increase in pig iron production in the past 15 years is not likely to be duplicated indefinitely. Even the statistical record would not bear out any prediction based on this period, for the reason that trade has moved in 20-year cycles and these 15 years have reaped most of the fruits of the whole cycle. Still, there is absolutely no reason to predict any halt or retrograde movement. The most sanguine predictions of the past have all been verified. Thus there is the memorable one of the late Abram S. Hewitt, who in 1856 predicted that the then production of 7,000,000 tons would double by 1875, and in 1872, noting the fulfillment in 1871 of his prediction for 1875, he then predicted that at the beginning of the twentieth century the world's production of pig iron would have reached 40,000,000 tons. The table here presented shows how that prediction was fulfilled, in the year 1900.

WORLD'S PIG IRON PRODUCTION, REDUCED TO GROSS TONS:

	1890	1895	1900	1905
United States	9,202,703	9,446,308	13,789,242	22,992,380
Germany	4,584,882	5,378,143	8,381,373	10,813,979
Great Britain	7,904,214	7,703,459	8,959,691	9,592,737
France	1,931,188	1,965,795	2,669,966	3,028,376
Russia	912,561	1,430,559	2,889,789	2,931,257[1]
Belgium	775,385	816,129	1,001,872	1,329,109
Austria-Hungary	910,685	1,119,852	1,472,695	1,300,000+
Sweden	483,155[2]	455,614	518,263	518,967
Canada	19,439	37,829	86,090	468,003
Spain	176,598	203,190	289,315	377,046
Italy	.....	9,067	15,619[3]	110,819[4]
Japan	.....	.....	54,299[3]	33,335[4]
Other countries	80,000	100,000	100,000	200,000
Totals	26,980,810	28,665,945	40,228,214	53,696,008

[1] 1904 [2] 1891 [3] 1901 [4] 1903

THE WESTERN RAIL DEMAND AND OPEN-HEARTH RAILS.

It is a remarkable record for a rail mill to sell practically a year's output of nearly three quarters of a million tons in less than three weeks, yet that is what has been done by the Illinois Steel Co. Its books were formally opened for orders for 1907 delivery about May 1, and last week it was announced that practically the entire

prospective production in 1907 was taken up, the prospects being that from 50,000 to 75,000 tons of orders taken for this year's delivery would be carried over, making a grand total of well over 600,000 tons. The company's rated capacity is 720,000 tons, but in the rail trade the rated capacities are not usually made. The Tennessee Coal, Iron & Railroad Co. is understood to be practically sold up for 1907 and the Colorado Fuel & Iron Co. is nearly so. The eastern rail mills, on the other hand, have sold only a moderate tonnage.

These incidents illustrate in an impressive way two truths which have already been accepted in the trade, first, that there is need of another rail mill in the west, and second, that the trend is towards the basic open-hearth rail. While the Illinois Steel Co. is practically sold up for next year, the Carnegie Steel Co. is still able to make sales for delivery this year. The Alabama mill, the only producer of consequence of open-hearth rails, started taking 1907 business and had accumulated a round tonnage before the northern mills started selling for such delivery. Moreover, it advanced its price a dollar a ton over its price for this year, and over what the other mills are charging for next year. Of course, on account of its location, the delivered price on much of its tonnage is less than had the purchases been made f. o. b. Pittsburg or Chicago, but the practice of selling rails f. o. b. mill, except in the case of Colorado, is well fixed on the trade. The action of the Alabama mill in advancing its price was no doubt very comforting to the old Bessemer rail producers, several of whom are contemplating the manufacture of open-hearth rails, for which they will doubtless be in position to insist on a premium.

The heavy demand for rails by western roads which has existed for two years and which is bound to continue for several years is due to the fact that these roads have become very prosperous and are in position to relay their lines with rails of standard weight. It was a very venturesome proceeding to build these roads in the first place, largely through trackless wastes and with miles and miles between points of freight origin. Naturally the roads were laid as cheaply as possible, with rails entirely inappropriate to modern practice.

The older roads, in the east, were laid with similarly light rails, but they sooner reached the point where they were compelled, and were able, to relay with heavier rails. They have now largely accomplished the work, and in many places heavy rails, 75 to 85 pounds, have already been worn out.

The United States is just now experiencing the heaviest demand for rails for replacement purposes it will see for many years. The demand for rails moves in great swings. When the railroads were being built in the first place, nearly all the rails made were for new roads. This demand reached its culmination in 1887, when 2,101,904 tons were turned out. There were heavy imports at the same time. Then new railroad building decreased, and rail production with it, until the time came for heavy replacement work, in the east. It was not until 1899 that the 1887 production record was broken. Production steadily increased until in 1902 and 1903 the 3,000,000-ton mark was almost touched. This demand was chiefly from eastern roads, for replacement purposes. Now we are experiencing a still heavier demand on account of the replacement demands of the western roads, the production for 1907 promising to be close to 4,000,000 tons.

With the advent of the open-hearth rail, longer life is to be expected and once the railroads are all laid with modern rails, increase in the annual tonnage is not likely to be so rapid.

IN THE SOUTHERN FIELD.

(Special Telegram.)

Birmingham, Ala., May 23.—The Dimmick Pipe Co. has secured an order for 5,000 tons of cast iron pipe for delivery during the remainder of the year. The pipe goes to New Orleans and is chiefly 24-inch.

It is announced that the Tennessee Coal, Iron & Railroad Co. has a deal on to re-purchase those railroad lines known as the Birmingham Southern, which were sold four or five years ago to the Southern and Louisville & Nashville. It is believed that the deal will be consummated by July 1. It will mean much for the Tennessee company.

SPLENDID SPIRIT

Shown by the People of San Francisco. The Present Outlook.

The San Francisco representative of the McClintic-Marshall Construction Co., of Pittsburg, in a letter to the home office says: "Matters are now settling down to a somewhat more normal basis, although conditions are deplorable in San Francisco; some 10,000 acres are laid waste, and this section was occupied by what represented the commercial and financial interests of San Francisco. The loss of life was quite heavy and the suffering intense in many cases, but the spirit which has been shown by all has been an uplifting one and it seemed no matter how poor one's condition may be, he is eager to serve one less fortunate, forgetting his own condition.

"One important feature stands out amidst all this ruin and that is the steel structures were not feased by the earthquake and the fire consumed only the interior fittings. All these buildings stand today so that with a very light expense, comparatively speaking, they can be put in active commission. The buildings that were most affected by the earthquake were the old frame and brick structures. Had it not been for the fact that the earthquake broke the water mains, thus cutting off the water supply, the damage to San Francisco would have been normal, for the greatest damage was done by the fire.

The lesson learned is certainly a severe one, but we feel it will be an enduring one and from the present ruins will rise a greater San Francisco, with all the present defects remedied. The demand for structural material will be a very heavy one; we already have our lines planned and well intrenched. Naturally, however, it will be some little time before anything can be done, for the wreckage must be cleared away, insurance paid, banks opened and capitalists able to move about. The present demand for galvanized iron is very active for temporary purposes and a lot of it is being sold. But all the officials, in fact every one, is united on this one fact—that steel structures and steel structures only must be the ones for the greater San Francisco and then, above all, the water supply must be so that a repetition of this catastrophe will not occur.

"We feel that the insurance companies will not delay matters or adjustments longer than is necessary, but at the best there will be more or less delay."

MERCHANT MARINE LEAGUE VISITS WASHINGTON.

President Roosevelt and Speaker Cannon each separately received a large delegation of the officers, vice presidents and many important members of the Merchant Marine League of the United States, at the White House and at the Capitol, respectively, on Thursday last, May 17. The delegation called in order to hasten the consideration of the Merchant Marine Commission's shipping bill by the House Merchant Marine and Fisheries Committee, and by the house of representatives.

President Roosevelt Heartily for the Bill.

The League party was much gratified with the outcome of the visit, feeling greatly encouraged both by the hearty support which President Roosevelt assured the visitors he had given to the bill in the past and is prepared to give it until it is enacted, and by the attitude of Speaker Cannon, who had been so erroneously represented as being strongly opposed to the bill. He had nothing whatever to say in opposition to the measure and his cordiality and expressions satisfied the delegation that at the proper time the Speaker's support would be found back of the bill.

Personnel of the League's Delegation.

President Harvey D. Goulder, of Cleveland, headed the delegation, and was accompanied by Secretary John A. Penton, also of Cleveland. The other members making up the party that called upon the president and the speaker were: Vice President Aaron Vanderbilt, of the Wheeler Condenser & Engineering Co., of New York City; vice president for Illinois, C. E. Kremer, admiralty attorney of Chicago; vice president for New Jersey, Col. E. A. Stevens, of Hoboken; vice president for New York, C. P. Letchworth, of Buffalo, president of the Pratt & Letchworth Co.; vice president for Maryland, R. M. Spedden, of Baltimore, a banker; vice president for Massachusetts, Hon. Samuel L. Powers, of Boston, former member of congress, and a leading New England attorney; vice president for Pennsylvania, George E. Bartol, of Philadelphia, president of the Philadelphia Bourse; Vice President Lyman H. Treadway, representing the Cleveland Chamber of Commerce; W. H. Hunt, representing the Cleveland Builders' Exchange, Abraham Stern, Francis Lyon and E. E. Strong, all prominent merchants and manufacturers of Cleveland; Daniel S. Emery, of Boston; J. A. McGean, president of the American Linseed Oil Co., of New York City; D. A. Tompkins, the well-known publicist and manufacturer, of Charlotte, N. C., representing the National Association of Manufacturers, specially appointed by that organization to co-operate with the Merchant Marine League in its efforts in behalf of the passage of the shipping bill; Francis L. Robbins, president of the Pittsburg Coal Co., of Pittsburg; John G. Shaw, of Detroit, Mich., attorney; F. S. Pendleton, of Islesboro, Maine; Hon. S. B. Dick, of Meadville, Pa., a prominent manufacturer and a former member of congress; R. H. Adams, of New York, a manufacturer; J. P. Robinson, of New York, a salt importer and warehouse man; J. G. Butler Jr., of Youngstown, O., one of the pioneer iron and steel manufacturers of the United States; H. H. Sharp, of the Buckeye Engine Co., of Salem, O.; H. S. Holden, of Syracuse, N. Y., president of the Commercial National Bank, accompanied by W. A. Holden and W. L. Smith, also of Syracuse, and John S. Hyde, of Bath, Maine.

Telegrams and letters of regret were also received from a large number of members, who are heartily in favor of the shipping bill, but were prevented from attending because of illness, or unavoidable engagements.

The Delegation's Reception at the White House.

The party called at the white house at eleven o'clock, by appointment, and was at once ushered into the cabinet room, where they were received by the president. President Goulder, of the League, addressed President Roosevelt, briefly referred to the career and work of the League, the educational campaign it has conducted, the unselfishness and disinterestedness of its members, who have nothing to gain, personally, by the passage of the bill, and their patriotic desire to see our foreign-going merchant marine increase and prosper as had the other great industries of the country. Mr. Goulder discussed the bill framed by the Merchant Marine Commission, its moderate character and provisions, what it would accomplish in starting the rehabilitation of our shipping in the foreign trade, pointed out that the matter of free raw materials for the building of ships for our foreign trade had been settled fifteen years ago by the provision to that effect in the last three tariff acts; the demonstrated ineffectiveness of a free ship measure to give us an American ocean-going marine, and the abandonment of that suggestion by practical men; the apparently insuperable obstacles to discrimination by tariff and tonnage duties; the superiority of the subsidy plan, and the manner in which the pending bill would, under the subsidy policy, give to the United States the needed start toword the upbuilding of its foreign-going shipping, and which, he pointed out, is the policy in force in other maritime countries. Mr. Goulder closed his remarks with the impressive reading of the following memorial, presented by the League, and signed by every member who was present:

The League's Memorial to President Roosevelt.

Mr. President:—Publicists and economists of authority from remotest time have urged the advantage in peace and war of an adequate merchant marine on the international seas to that nation whose situation and business habits invite or permit of its existence.

OUR SEACOAST, FOREIGN TRADE AND OCEAN FREIGHT BILL.

This country, with the greatest navigable seacoast of all, whenever and so long as it had fair competitive terms, flourished in its shipping, and now, furnishing or providing nearly a seventh of the world's over-seas interchanges, carries about one-tenth of this under our flag, while foreigners take about half a million dollars each day for our freightage. And about a sixth of our tonnage is definitely stated to be under option to a subsidizing nation—this the cream of what we have left.

STATESMEN, PRESIDENTS, BUSINESS MEN ALL UNITED.

Party platforms, presidential messages, testimony of statesmen, and of those engaged in business pursuits, never more definitely and certainly than now have united in one unbroken current favoring the broad proposition of the national advantage of a merchant marine and its applicability to our country and our people.

NATIONAL ADVANTAGES, COMMERCIAL ADVANTAGES, NATIONAL SAFETY.

Rehabilitation of a great national industry in shipbuilding, repairing and outfitting, the commercial advantage of bringing so many millions of dollars of freight earnings annually into the channels of circulation in this country, would be matched or exceeded by the advantage of having our own commercial instrumentalities to develop trade abroad, and on occasion the element of safety, all of which must follow if we accept the world-wide testimony as to the value of a nation's own flag on the seas.

PENDING SHIPPING BILL OUTCOME OF PRESIDENT'S EFFORTS.

The Merchant Marine League, learning from current rumor that the pending legislation is in danger of neglect, takes occasion with your permission to call attention to the things above stated,

and to the fact that the bill now before congress is the outcome of long and careful effort of a special Congressional Commission appointed as a result of the recommendation of your own message to congress.

POWERFUL AND WIDESPREAD INDORSEMENT OF BILL.

This bill has the indorsement of great national organizations, including the American Bankers' Association, National Association of Manufacturers, National Board of Trade, American Cotton Manufacturers Association, National Metal Trades Association, National Founders Association, National Association of Wholesale Druggists, and others, and of a large number of local business and manufacturing associations in all sections of the country, representing tens upon tens of thousands of competent, successful, patriotic and thoughtful men scattered throughout the length and breadth of the land.

RELIANCE UPON PRESIDENT ROOSEVELT'S HELP.

Our hope and our request is that whatever may be in the power of the president in line of the recommendations of all the presidents of the United States may be done to bring this matter before the people for thought and discussion, and before congress for action, to the end that the desired consummation of restoring our American shipping may be speedily achieved.

President Roosevelt's Hearty Approval Warmly Expressed.

President Roosevelt's response was commendatory, sympathetic and emphatically favorable. Like the Methodist brother, he said, he had conviction, and needed no persuasion. He realized the great necessity for a merchant marine, had long and repeatedly advocated the creation of one, had appealed to congress over and over again for effective legislation to that end, had studied the bill prepared by the Merchant Marine Commission, which he regarded as an eminently good, skillfully drawn measure, and one, he was convinced, which would go a long way toward accomplishing that which the people of the country so overwhelmingly desired—the rehabilitation of our shipping in the foreign trade. The president assured the delegation that he had done all that in the past seemed to him wise to do; he was still ready and eager to do whatever it was yet possible for him to do, to secure early and favorable consideration for the bill in the house of representatives. The mission of the League, it was apparent from the interview with President Roosevelt, was not with him, whose sincerity and whose enthusiastic desire for the bill's early enactment admitted of no possible doubt whatever, but with the legislative branch of the government, particularly the house of representatives, and Speaker Cannon.

Secretary Shaw Seen.

After a brief call upon Secretary of the Treasury Leslie M. Shaw, who is a loyal friend, so earnest, so persistent and so eloquent an advocate of an American merchant marine, as has been shown over and over again in his public speeches, the delegation proceeded to the capitol, where the members were presented to Senators Foraker and Dick, of Ohio, good warm friends of the shipping bill.

Speaker Cannon Waited Upon by the League Delegation.

The party was then conducted to the ways and means committee of the house of representatives, where it was met by Representatives Charles H. Grosvenor, chairman of the House Merchant Marine and Fisheries Committee, in which committee the shipping bill is now lodged, and by Representative John Dalzell, by whom the members were presented to Speaker Cannon.

Strong Argument for Passage of Shipping Bill.

President Goulder again, and in a most earnest manner, presented to the speaker arguments similar to those presented to President Roosevelt, made clear to him that the present condition of American shipping in the foreign trade is humiliating, dangerous and intolerable; that remedial legislation has long been promised, and that the time for its enactment has arrived; that the country is not only ready for shipping legislation, but it is eager for it—insistent for it; that the great commercial, financial and industrial organizations, national, state and local, in every part of the country, which have repeatedly adopted resolutions in favor of an American oversea shipping, were now specifically demanding the passage of the Merchant Marine Commission shipping bill, and that the League was equally pronounced in favor of that bill as the best measure yet prepared with which to make the needed start toward the possession, by the United States, of a foreign-going marine measurably equal to its maritime and commercial needs.

Speaker Cannon Attentive and Friendly.

Speaker Cannon listened with careful attention to what was said, and was most agreeable and gracious in his reply. He showed a keen appreciation of the difficulties besetting those who have so long labored for the upbuilding of our ocean shipping. No one who heard Speaker Cannon could doubt that he clearly understands the situation. There can be no doubt that the delegation made a strong and favorable impression upon the speaker, that he could not escape the conviction that he saw before him men of high character, conspicuous in their several communities, animated by an unselfish and determined purpose to persevere in the educational work in which they have been so industriously engaged until their efforts are crowned with enduring success. The speaker's manner was most friendly and genial, and it was the unanimous conclusion of the delegation, when it retired from the speaker's presence, that he can be relied upon to assist in the passage of the shipping bill. He did not, however, pledge himself to favor the passage of the bill at the present session of congress.

The impression made by the Merchant Marine League delegation in Washington was most helpful to shipping legislation, and served to remove the doubts that have been created in some minds by hostile criticism as to the character and standing of the men who are taking the lead in the country in behalf of American shipping legislation in general and the pending Congressional Merchant Marine Commission's bill in particular.

The belief is now that the shipping bill will shortly be reported favorably from the House Merchant Marine and Fisheries committee, and substantial hope is felt for its passage before the present session closes. There is much for the Merchant Marine League yet to do, and it is girded up to the work which it is engaged in, and which it is prepared to continue to final and permanent success.

Engineers' Banquet.—The field engineers who have been working together in the erection of the new No. 14 structural mill of the Jones & Laughlin Steel Co., held a banquet at the Monongahela House, Pittsburg, Friday evening, May 18, to celebrate the successful completion of the big work and mark the breaking up of the engineering corps which had charge of it.

J. K. Yoder, engineer of construction for the company, presided as toast master. Other addresses were made by C. P. Clark, assistant engineer of construction, "The Importance of the Panama Canal;" T. P. McCallen, "Reinforced Concrete;" J. A. Gaynor, "The Negro Question;" C. E. Ralston, "The Practical Engineer;" F. A. Burgar, "A Modern Boiler House;" J. W. Troy, "Life Insurance;" C. A. Alexander, "The Truth, Always the Truth, or Where Are Those Bolts." The closing address was made by L. K. Yoder. The program was interspersed with vocal and instrumental music and other entertaining features.

Mr. W. L. Jones, general manager of the Jones & Laughlin Steel Co. has sailed for Europe.

DEMANDS MADE BY STRIKING MOLDERS.

Late advices from centers particularly affected by the molders' strike, generally indicate that the situation is unchanged. Employers continue to hold firmly to their original position and not an instance has been reported this week of any compromise with the strikers or capitulation to their demands. In Pittsburg the molders are still at work and their representatives have been unable to obtain a conference with foundrymen. In other cities where the strike is in force dissatisfaction is already apparent among the better classes of molders. The calling out of apprentices and additional union men in a number of shops has increased the drain on the strike benefit fund. Especially at Milwaukee, St. Paul and Minneapolis foundrymen report good progress in employing new men; in the latter two cities open shop notices have been posted in all foundries.

N. F. A. Statement.

The National Founders' Association has issued the following statement of the demands, upon which the large number of molders now involved have inaugurated their strikes.

CHICAGO: Purely a demand for the closed shop agreement. Subject of wages had been adjusted early in April. Eighteen shops still on strike involving 730 men who went out May 1.

SCRANTON: Demands are for a nine-hour day at same rate of wages. Rate now paid $2.75 and upwards; hours, ten for the day. Molders would also like the formal written contract with the foundrymen.

BOSTON: An increase of 25 cents on the present minimum of $2.75 is demanded here for a nine-hour day. Nearly 475 men are involved. Strike started April 23. All foundries affected are determined not to grant the demands.

ST. LOUIS: The stove molders have demanded the unionizing of the Buck Stove & Range Co. of this city. Nearly 300 molders are involved.

NEW ORLEANS: The strike in this city started in one shop upon which a demand was made for an increase in the minimum to $3.50, for nine hours, and the signing of an agreement. The difficulty soon spread to nine other shops and about 300 men have been on the street since May 3.

WILMINGTON, DEL.: About 25 members of the union are out in this city because of a demand for increased wages and closed shop conditions.

TOLEDO, O.: A $3.00 minimum rate was demanded in this city, meaning an increase of about 25 cents for the ten-hour day. The coremakers also desire recognition of a minimum of $2.75. Six foundries employing about 150 union members are involved.

HAZELTON, PA.: About 50 members of the union went on strike in this city about the first of the month. They had demanded a nine-hour day at the prevailing minimum of $2.75.

MILWAUKEE: An increase in the minimum from $3.00 to $3.25 with a reduction in hours from ten to nine, coupled with a formal closed shop written agreement, was demanded in this city. The coremakers also wanted the recognition which they have not had in several years. Sixteen shops and from 1,000 to 1,200 men are involved. Strike started May 1.

BUFFALO: The demands here were for an increase in the minimum rate of molders from $2.80 to $3.00 per day with a reduction in hours from ten to nine and the signing of the closed shop formal written agreement.

MINNEAPOLIS and ST. PAUL: The minimum rate in effect at Minneapolis and St. Paul for molders has been $2.88 for the nine-hour day. The molders demanded $3.15 for nine hours and the coremakers $2.75 and made the most strenuous efforts to secure a closed shop written agreement.

GRAND RAPIDS: One hundred and eleven men in seven shops went on strike about May 1 in this city for the purpose of compelling the foundrymen to grant an increase in the wage rate from $2.75 to $3.00 per day, and a reduction in hours from ten to nine, coupled with the signing of the closed shop agreement.

TOPEKA, KAN.: Twenty men employed in five shops in this city are on strike to secure a raise in the minimum from $2.75 to $3.00 for molders and from $2.25 to $2.75 for coremakers, with a reduction in hours from ten to nine, and the signing of a formal agreement.

BELOIT, WIS.: An advance in the minimum from $3.00 to $3.25 per day has been requested by the molders of Beloit, with a reduction in hours from ten to nine, and the signing of the formal agreement.

KANSAS CITY, MO.: The demands of the union at Kansas City are for the recognition of a minimum rate of $3.00 per day with a reduction in hours from ten to nine, and the signing of the closed shop agreement. The coremakers also request an increase from $2.75 to $3.00 per day.

SPRINGFIELD, MO.: About 50 men went out in this city on May 1, for the purpose of insisting upon the recognition of a minimum of $3.00 per day for molders and reduction of hours from nine and one-half to nine, and now demand the closed shop agreement.

TROY, COHOES and WATERFORD, N. Y.: The molders and coremakers in these cities are on strike in sympathy with the foundry laborers' union, which had demanded recognition. Reports as to the exact number of shops and men involved have not been received.

Statement By a Union Official.

The following statement concerning the strikes is made on authority of a union official:

"None of the strikes are for a union shop. The union is not demanding of any foundrymen to agree to run union shops, and the questions at issue are purely and solely hours and wages, and so far as the Iron Molders' Union is concerned, the question is not one of unionism, but of wages to be received by molders and length of work days. The statement made by the foundrymen that the demand is for a union shop is based upon a misapprehension. The molders have not in any instance raised the question of a closed shop agreement, and that feature of the controversy has not been touched upon by them.

"In Boston, the molders are striking for 25 cents per day advance on the minimum wages.

"In St. Paul and Minneapolis the strike is for an advance in the minimum for molders and core makers.

"In Milwaukee the contention is for a nine-hour day instead of ten hours, and an advance in the wage scale minimum for molders and core makers.

"In Chicago the demand is for 25 cents per day increase in the minimum wage scale for molders and core makers.

"In Buffalo an advance in the minimum wages for molders and coremakers and a nine-hour day instead of ten is demanded.

"In Cleveland a settlement has been made without strike.

"In Pittsburg the contention is for an advance in the minimum wage scale.

"In Philadelphia the trouble is over a demand of the core makers for a minimum of $2.75 per day.

"In Kansas City a $3.00 per day minimum rate and a nine-hour day for molders is demanded.

"In Providence the contention is for a nine-hour day."

Tin Plate Workers.

The eighth annual convention of the International Tin Plate Workers' Association closed at Canton, O., last Friday, after sessions lasting twelve

days. The wage scale was completed and made ready for presentation to the American Tin Plate Co. and the independent interests, all of which will receive the report before July 15 when the present scale expires. All officers were re-elected with the exception of Ben Teegarten, who asked to be relieved as vice president and was succeeded by A. J. Crouse. The convention adopted resolutions urging the election of officers favorable to the demands of labor, and condemning the removal of officials of the Western Federation of Miners from Colorado without extradition papers. The next convention will be held at Columbus, O., the second Tuesday in May, 1907.

Labor on the Lakes.

The Great Lakes Towing Co. has signed an agreement with the tugmen, tug firemen and linemen whereby peace in this line of lake navigation is assured for the next two years. The wage scale continues unchanged and other articles of agreement are the same as last year with the exception that the men are granted more time off at those ports where the work is most strenuous. An agreement has not yet been reached with the Marine Firemen, Oilers and Water Tenders' Association. A vote has been taken on the proposition made the association by the vessel owners but its result has not yet been announced. No difficulty is expected, however, in this regard and the labor situation on the lakes promises to be entirely satisfactory throughout the season.

In the Labor Field.

Robert Wuest, secretary and acting commissioner of the National Metal Trades' Association, has taken personal charge of the machinists' strike at Indianapolis. A large number of workmen have already been secured.

The machinists' strike in Boston and Lynn is being continued with no concessions by the employers, who are filling their shops with non-union men. At Lynn 200 men are out.

Branches of the National Metal Trades' Association have been established at Atlanta, Ga., and at Indianapolis during the last ten days.

Molders' Demands Granted.

St. Louis, May 22.—In Belleville and Kansas City the molders' strikes continue unabated, but activity has been resumed at Joplin, Mo., where all five of the foundries are running full capacity. All of the foundries have granted the demands of the men for a nine-hour day at the same wage a day with the exception of the Freeman Foundry & Machine Co. which is operating under the "open shop" plan. Only three Kansas City foundries are running, they have conceded the demands of the men. In Atchison, Kan., where trouble was threatened, all has been smoothed over, and the foundries are running at full capacity. They have all they can do to fill big railroad orders.

MASS MEETING

Proposed by the Pittsburg Manufacturers to Employes.

(By Telephone.)

Pittsburg, May 23.—The following has been issued by Pittsburg employers of molders and coremakers:

To the molders and coremakers in iron clay in our employ:

Gentlemen:—

In answer to a request for a conference to discuss wages, we desire to make the following answer:

Inasmuch as former conferences between the representatives of the molders and the representatives of the manufacturers, both in local and national conferences, have proved unsatisfactory, the employers of molders and core makers in this district desire to make this form of answer:

Wages:—Last year, when it appeared that conditions would improve, the manufacturers of this vicinity made a voluntary advance of 10 per cent in the general wages of molders and coremakers and other employes, since which time some special employes of special merit have received individual advances. Very few, if any, of the other competitive centers employing molders and coremakers have made any general advance in wages, so that the manufacturers of this vicinity have been at a disadvantage, inasmuch as they are paying higher wages than any competitive point, such as Philadelphia, New York, Troy, Syracuse, Buffalo, Erie, Cleveland, Akron, Toledo, Fort Wayne, Chicago, Milwaukee, St. Louis, Indianapolis, Cincinnati, Columbus, Wheeling and all intermediate points, this difference being from 30 cents to 50 cents per day with the average molder and 30 cents to 75 cents per day with the average coremaker, to say nothing of the difference in time and work in many of the above centers; that is to say, in most places they work ten hours, while in Pittsburg and vicinity shops work nine hours. We are paying higher wages than any other competitive district as stated in our notice.

How to Secure Higher Wages.—The manufacturers admit that certain classes of molders should receive higher wages because of their skill and character of the work and the quantity of work which they are capable of doing, if permitted to do so. The superior workman can earn higher wages, if he will give an equivalent in output.

Mass Meeting.—The employers suggest that inasmuch, as stated above, conferences between representatives of organizations and associations are of little value, a mass meeting be held consisting of the employers of Pittsburg and vicinity and the molders and core makers, exclusively, at which meeting, there can be discussed all conditions arising out of or pertaining to wages and questions governing the same.

You are, therefore, invited to attend a mass meeting to be held at the Alvin Theatre on Sunday afternoon, May 27, at 2 o'clock.

The above is signed by all of the employing molders in the Pittsburg district.

DEATH OF SIR DAVID DALE.

One of England's famous iron masters has joined the majority in the person

SIR DAVID DALE.

of Sir David Dale, Bart, of Darlington. He was 77 and of late years has not been so prominent as formerly. But his services to the trade were great and he will always be remembered as one of the founders of the Northern Conciliation and Arbitration Board, which has put an end to the miserable reign of the strike. He was connected with Messrs. Pease & Partners, Ltd., Barrow Hematite Steel Co., Consett Iron Co., and a great many other companies in addition to being one of the founders of the Iron and Steel Institute.

Hickman Williams & Co. at Cincinnati have been appointed agents for the new Chattanooga furnace of the Chattanooga Iron & Coal Co.

PERSONALS.

R. S. Henderson, of Sharon, Pa., has returned from an extensive European tour.

Joseph A. Durfee, general superintendent of the steel plants of the Tennessee Coal, Iron & Railroad Co., has resigned.

E. S. Rooney, of the Carnegie Steel Co., will be in charge of the Pittsburg office of the Youngstown Sheet & Tube Co., Youngstown, O.

William V. Kelley, president of the American Steel Foundries, has been made a director of the Commercial National Bank of Chicago to succeed Paul Morton.

William P. Harper, formerly with the E. P. Allis Co. and the Wm. Bayley & Sons' Co., has been placed in charge of the department of purchases and stores of the Allis-Chalmers Co.

L. V. Brown, general manager of the Star Furnace Co., Jackson, O., was in Pittsburg last week looking after the purchase of machinery for extensive coal properties in the Athens, O. field, in which he is interested.

B. F. Harper, who has been appointed sales agent of the Fort Wayne Rolling Mill Co., was formerly with the Carnegie Steel Co. and the Republic Iron & Steel Co. His headquarters will be located at Fort Wayne, Ind.

H. C. Baker, formerly in charge of the Atlanta office territory of the Crocker-Wheeler Co., has gone to San Francisco to take charge of the Pacific Coast offices which are temporarily at 2611 Broadway. The offices at Fremont and Howard streets, San Francisco, were completely destroyed by the recent fire.

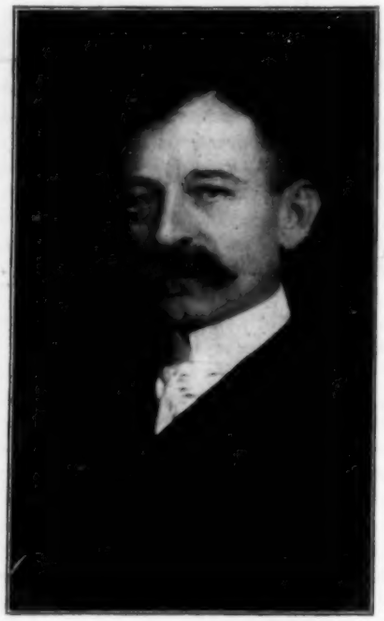
C. S. Robinson has resigned his position as general manager of the iron and steel departments of the Colorado Fuel & Iron Co. The resignation takes effect June 1, but the plans of Mr. Robinson as to his future connections have not been disclosed. He has been connected with the Minnequa plant of the Colorado Fuel & Iron Co., in Pueblo, for more than ten years.

L. R. Bush, a well known St. Louis iron man, has just returned from a trip of inspection through the south and southwest. In the Joplin and Memphis districts business is humming, he reports, but in southern Illinois, western Kentucky, Tennessee and Arkansas quiet prevails. A great deal depends upon the crops. There have been no labor troubles in Memphis, and all the foundries there are running full blast.

Charles T. Allen, for many years secretary and treasurer of the Union Steam Pump Co., Battle Creek, Mich., has retired from active connection with the company on account of ill health. By his retirement control of the company passed into the hands of Chas. E. Kolb, L. B. Anderson, H. A. Latta, John Heyser and Ila N. Moore. Mr. Latta, who has been manager of sales, has been elected secretary, and Mr. Anderson, who is also treasurer and manager of the Advance Pump & Compressor Co., has been made treasurer. Mr. Heyser is superintendent of the company as well as president of the Advance company, of which Mr. Moore is vice president.

DEATH OF WILLIAM HENRY BURTNER.

William Henry Burtner, of Cincinnati, passed away Thursday, May 17. Two years ago Mr. Burtner sold out his interest in the Cincinnati Planer Co., and retired from business on account of ill health. He was with Mr. B. B. Quillen, the founder of that company, and was its president until November 1904.



W. H. BURTNER.

Mr. Burtner was born in Cincinnati and began his business life in the service of the firm of R. Macready & Co., wholesale druggists. He became bookkeeper and salesman and later formed a partnership and bought out the business which became the firm of Runkle & Burtner. He sold his interest in this concern and became associated with the Lodge & Davis Machine Tool Co., and remained with this company after its re-organization and change of name to the American Tool Works Co. He was vice president of the American Tool Works Co. until 1897 and in 1898 organized the Cincinnati Planer Co.

Mr. Burtner was held in high esteem all through his business career in Cincinnati, and was widely known among the machine tool builders throughout the country. He was quiet and unassuming, but always cordial and courteous. His close associates in business feel a deep sense of personal loss in his death.

Deloss Eldredge died at his home in Buffalo, N. Y., May 10, at the age of 75. For the past 40 years he had been connected with the firm of Farrar & Treffs.

James L. Howard, president of James L. Howard & Co., died May 1 at Hartford, Conn. He was 88 years of age and was at one time lieutenant governor of Connecticut.

Fuchs Iron Foundry, Brooklyn, died Fuch Iron Foundry, Brooklyn, died May 12. He was 54 years of age and had been identified with the iron foundry business practically all his active life.

John W. Hartness, for many years connected with the Otis Steel Co., Cleveland, O., died May 11 at Springfield, Vt. His son, James Hartness, is president of the Jones & Lamson Machine Co.

Thomas L. Higgins, formerly proprietor of the Watt Iron Works, Brooklyn, died on Saturday, May 12, at his home, No. 218 Legraw avenue, Brooklyn, of a complication of diseases. He was 65 years old.

Johnathan Mathews, founder and treasurer of the Mathews Steam Boiler Works, South Bend, Ind., died May 12, after a brief attack of heart trouble. He was a native of England and was 65 years of age.

General John McCarthur died at Chicago, May 16, aged 79. Prior to the war in which he distinguished himself for bravery, he was a machinist and blacksmith, and had established a boiler manufactory of considerable size. He was for five years postmaster of Chicago.

H. A. Barnard, president and founder of the Barnard & Leas Mfg. Co., died at Moline, Ill., May 14. He was a native of Vermont, but went to Moline in 1854 and began the manufacture of mill, warehouse and elevator machinery and grain cleaning machines. A number of firm changes were made until in 1872 the company was re-organized as the Barnard & Leas Mfg. Co., turning its attention exclusively to mill machinery in which Mr. Barnard's inventive genius gave it wide reputation.

Coal-handling Equipment of the Boston Coal Dock & Wharf Co., Duluth, Minn.

The accompanying illustrations show two conveyor bridges designed and built by the Wellman-Seaver-Morgan Co., Cleveland, and installed on the dock of the Boston Coal Dock & Wharf Co., Duluth, Minn. The machines are used for unloading coal from lake barges and storing it in stock piles; also for rehandling coal from the stock pile to screens which are placed in the tower of the bridges, screening the slack from the coal and depositing the slack on storage piles, and the screened coal in box cars on railroad tracks.

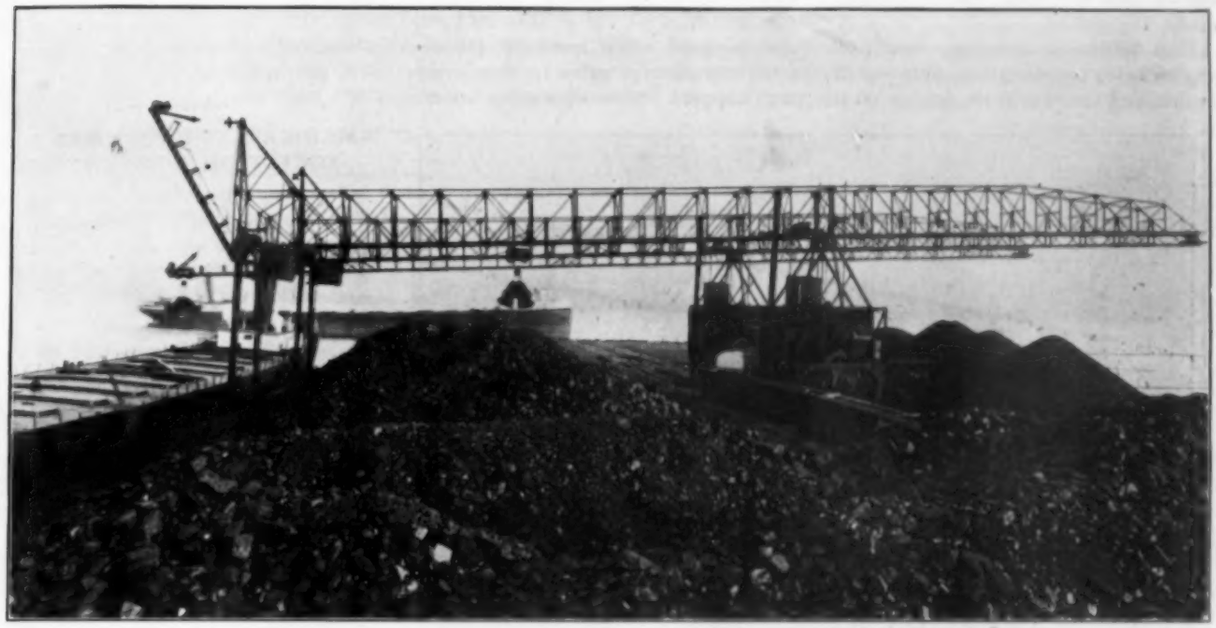


FIG. 1.—HULETT STEAM-OPERATED CONVEYOR BRIDGE AT DOCK OF BOSTON COAL DOCK & WHARF CO., DULUTH, MINN. WATER LEG RAISED.

FIG. 2.—HULETT STEAM-OPERATED CONVEYOR BRIDGE AT DOCK OF BOSTON COAL DOCK & WHARF CO., DULUTH, MINN. WATER LEG EXTENDED AND BUCKET DISCHARGING.

Each conveyor consists of a bridge having a central span 176 feet long, a fixed cantilever at the rear end 130 feet in length, and a folding or hinged cantilever at the front end of the bridge 53 feet long. The latter carries the tracks for the trolley out over the

hatches of the boat, but is so arranged that it may be folded up clear of the masts and rigging of steamers and barges coming alongside the dock. The front end of each bridge is supported by a shear leg, and the rear end by a tower in which is located the machinery for operating the trolley and bucket and for traversing the bridge along the tracks.

East bridge is steam operated, one engine being provided for operating the bucket and traversing the bridge on its tracks, and a separate engine for traversing the trolley which is carried on tracks hung from the bridge. A third engine operates the screening arrangement. The towers are equipped with screening chutes, with a belt conveyor for conveying slack coal to the outer side of the bridge. These screening chutes are provided with gates at the hopper, so that the flow of coal can be accurately controlled. At the lower end of the screening chutes are telescopic folding chutes which may be adjusted to any desired length for convenience in discharging the coal into box cars on the railroad track.

Two operators' cabs are provided on each bridge; one on the shear leg from which the bridges are operated when unloading boats, thus enabling the operator to see the operations on the inside of the vessel. The second cab is located on the machinery tower, and is used when handling the coal from the storage piles to the screening hoppers. The operating connections to either tower may be readily engaged or disengaged as required.

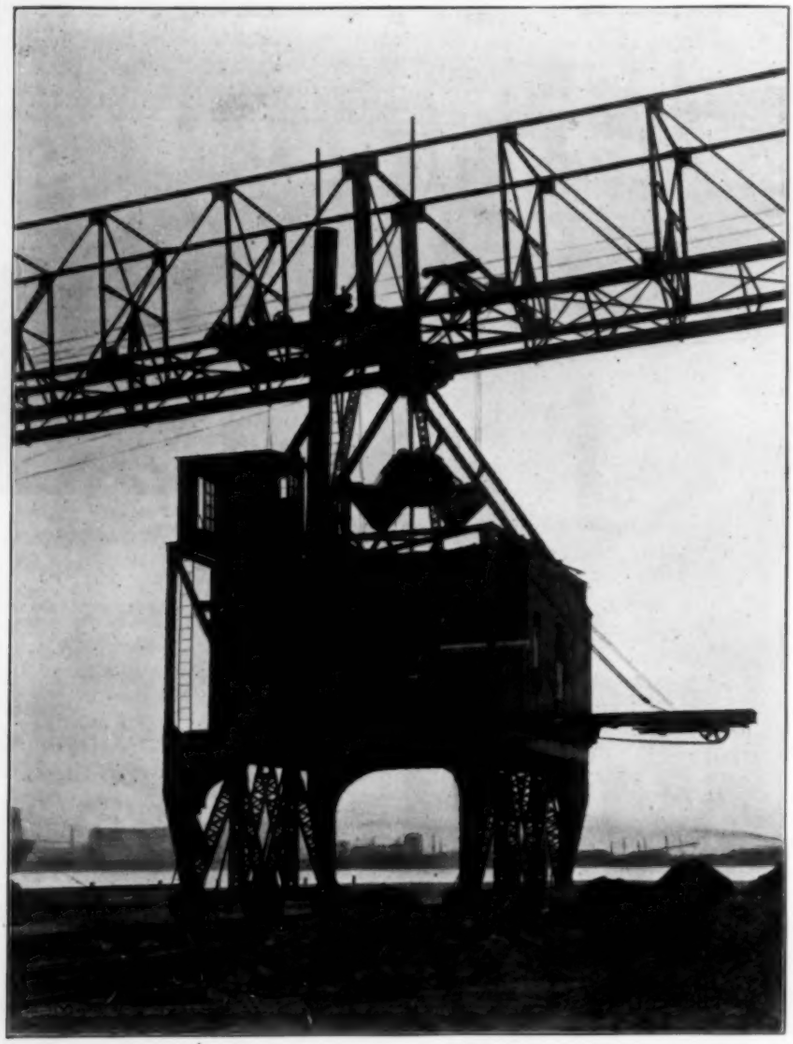


FIG. 3.—SCREENING HOPPER OF HULETT STEAM-OPERATED CONVEYOR BRIDGE.

Coal may be stored in open piles beneath the center span or beneath the rear cantilever extension. The folding cantilever is raised and lowered by means of a drum, driven by the engine which operates the bucket. This drum is provided with brake for holding it, and also with a clutch so that the drum may be connected to or disconnected from the engine, as may be required. The bridges are equipped with the Hulett patent excavating buckets, each of a capacity of two tons of coal.

The hoisting arrangement of the ropes is along the lines of the late Hulett patents, and are especially designed for giving maximum speeds of operation, hoisting the bucket and load at a speed of 250 feet per minute, and cross traversing at 1,000 feet per minute. The bridges are self-propelling along the dock at a speed of about 75 feet per minute.

AMERICAN FOUNDRYMEN'S ASSOCIATION CONVENTION.

The annual convention of the American Foundrymen's Association, together with the convention of the Associated Foundry Foremen, an affiliated body, will be held in Cleveland June 4 to 7.

The A. F. A. was organized on purely engineering and scientific lines, for the betterment of foundry practice. The association has absolutely nothing to do with labor questions of any kind and the members meet once each year to read and discuss papers on foundry subjects. Something of the estimation which our foreign contemporaries have of the association may be judged from the fact that similar societies have been formed in Great Britain and Germany during the past two years and in both cases the work has been modeled after that of the American Foundrymen's Association.

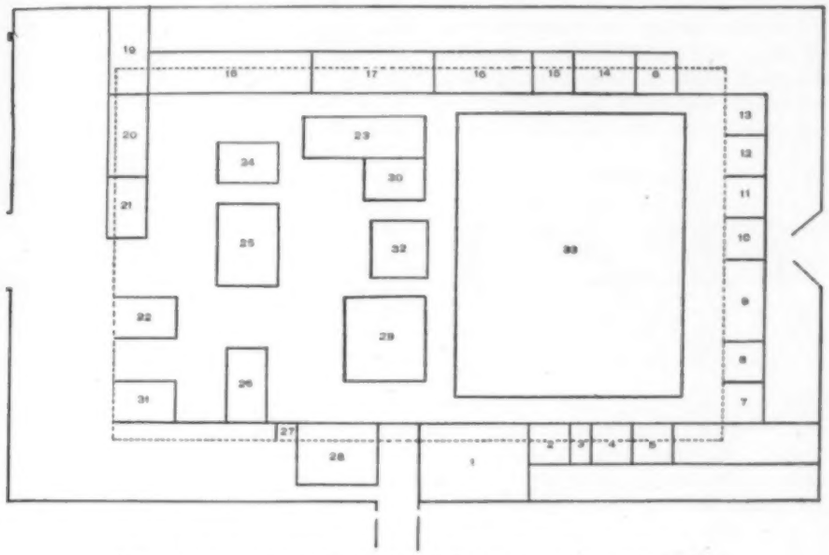
Dr. Richard Moldenke, the very efficient secretary, is known to all foundrymen and has been tireless in his work for the betterment of foundry practice. Thomas D. West, who is president this year, is also very well known among foundrymen.

The list of papers which will be read this year is long and the papers of unusual interest. Another feature which will be a decided novelty is the fact that there will be a large exhibit of foundry supplies and equipment in connection with the convention. The meeting will be held in the Central Armory, which is a building 120 x 207 feet. The convention space will be entirely surrounded by exhibits, so that the meeting will literally be held in a foundry. A 55-horsepower gas engine will drive a line of shafting which will operate several power exhibits. Some of the other power exhibits will be run by electricity. The gas engine will also drive an air compressor for operating pneumatic molding machines and other pneumatic appliances. Over thirty spaces have been engaged in the exhibit and several more are under consideration.

The entertainment features of the

convention will be especially fine and will include a theater party, a boat ride, a smoker, etc. Special attention will be given to the entertainment of the ladies who attend the convention.

Indications now point to a very large attendance, especially on the part of foundrymen, and it is hoped that this will be the banner meeting of the association. Special arrangements are being made to bring two or three sleeping cars full of people from Pittsburg, at least one car full from Philadelphia, and Mr. George H. Griffiths, western editor of THE IRON TRADE REVIEW, is arranging for a party to leave Chicago at 10:30 Sunday night.



ARRANGEMENT OF EXHIBITS AT THE FOUNDRYMEN'S CONVENTION.

1. Berkshire Mfg. Co.
2. Detroit Foundry Supply Co.
3. Diamond Clamp & Flask Co.
4. W. W. Lindsey.
5. Interstate Sand Co.
6. American Sand Co.
7. Macphail Molding Machine Co.
8. Chisholm & Moore.
9. Arcade Mfg. Co.
10. Headquarters Desk.
11. Cleveland Wire Spring Co.
12. THE FOUNDRY.
13. Western Foundry Supply Co.
14. B. F. Sturtevant Co.
15. Holland Linseed Oil Co.
16. Falls Rivet & Machine Co.
17. Standard Sand & Machine Co.
18. W. W. Sly Mfg. Co.
19. Bruce, Merriam, Abbott Gas Engine Co.
20. Chicago Pneumatic Tool Co.
21. Tabor Mfg. Co.
22. Herman Pneumatic Machine Co.
23. Atlas Car & Mfg. Co.
24. Crescent Machine Co.
25. Goldschmidt Thermit Co.
26. Electric Controller & Supply Co.
27. William Dobson.
28. J. D. Smith Foundry Supply Co.
29. Osborne Mfg. Co.
30. Whiting Foundry & Equipment Co.
31. E. H. Mumford Co.
32. Speakers Stand.
33. Convention Space.
Connersville Blower Co.

Among the papers to be presented to the convention are the following:

"The Beneficial Effects of Adding High Grade Ferro-Silicon to Cast Iron," by Alexander E. Outerbridge Jr.; "Electricity in the Foundry," by F. L. Antisell; "Molding Problems," by David Spence; "Developments in the Thermit Process in Foundry Practice," by W. M. Carr; "Dark Secrets in Foundry Practice," by Wm. H. Perry; "Uniform Practice in Foundry Cost Finding," by Kenneth Falconer; "The Manufacture of Soil Pipe and Fittings," by T. J. Best; "Foundry Tests of Coke made by the U. S. Fuel Testing Plant," by Dr. Richard Moldenke; "Report of the Committee on Standard Methods for the Analysis of Iron"; "Good Molders.—Why they are Scarce," by W. S. McQuillin; "A Talk on Alloys," by C. Vickers; "The Correct Application of True Burden to Iron Cost," by E. M. Taylor; "Multiple Molding," by J. F. Webb; "The Construction and Operation of Air Furnaces," by Ralph D. West; "Tests of Cast Iron," by Prof. C. H. Benjamin; "Pattern Shop Equipment," a joint paper by the Cleveland Club of Patternmaker Foremen; "Sanitary Appliances for the Foundry," by H. M. Lane.

The Crocker-Wheeler Co., Ampere, N. J., has received advices from its Pacific coast representative that its stock at San Francisco is a total loss. Three of the four 4,000 kilowatt direct current Crocker-Wheeler generators, recently sold to the California Gas & Electric Corporation for the street railway system, are in good condition.

The mechanical section of the Engineers' Society of Western Pennsylvania will meet June 5. J. R. Bibbins, of the Westinghouse Machine Co., will discuss "Operation of Gas Driven Electric Power Systems as Exemplified in the Warren & Jamestown Railway."

A NEW LIQUID MEASURING APPARATUS.[1]

BY GEORGE B. WILLCOX.[2]

The liquid measuring apparatus herein described was originally designed to automatically measure brine flowing from a salt well into a salt works. After about a year's satisfactory operation in that capacity, tanks of the same type, but modified in detail, were designed and set up as a permanent part of a boiler room equipment, to automatically measure and record the amount of feed water supplied to boilers. Apparatus of this kind designed as a portable testing device has proven of the greatest service on evaporative tests, for it does away with the uncertainties and hard work of weighing by the usual tank and scale method.

It may be more correctly termed a weighing rather than a metering device, as will appear later, and it will be so described.

Notable features of the device are: Elimination of constant errors of graduation, present in many water meters. Its operation is not appreciably affected by air in the liquid, or by changes in temperature, head or quantity of discharge of the liquid being weighed, and clogging by dirt is not liable to occur.

These advantages are due to the fact that no discharge valve is used in the weighing tank, avoiding the possibility of leakage, and to the reliability of the counterbalancing weight employed, namely, a liquid column of fixed weight.

The apparatus accommodates itself to an irregular supply and delivers intermittent charges or units of uniform weight. It consists of two tanks placed one above the other. The upper or receiving tank stores the liquid and automatically delivers it at intervals as required to the lower tank where it is weighed. The lower or weighing tank delivers the unit charge intermittently, the intervals between deliveries varying with the rate of supply.

The general operation of the apparatus is as follows: Liquid accumulates in the upper tank until it overflows a stand pipe located in the upper tank, and spills into the tank below. After a small quantity of overflow has accumulated in the lower tank, the stored liquid in the upper tank is suddenly emptied into the lower tank. Further supply, instead of accumulating in the upper tank as before, flows

[1] Presented at the Chattanooga meeting (May, 1906) of the American Society Mechanical Engineers.

[2] Manager Saginaw Engine Co., Saginaw, Mich.

along its bottom and drops into the lower. The liquid in the lower tank automatically discharges when a unit charge has accumulated, and simultaneously the outlet from the upper tank to the lower tank closes, preventing entrance of liquid into the lower tank while the weighed charge is escaping from it. The apparatus is shown in the accompanying illustrations. Fig. 1 is a vertical section of the apparatus adapted for measuring hot water. Fig. 2 is a detail of the upper tank adapted for measuring cold water. Fig. 3 is a modified form of trip.

Referring to Figs. 1 and 2, (A) is the upper or receiving tank and (B) the lower or weighing tank. (1) is the inlet for liquid to be weighed, having a baffle plate (1a) to prevent splashing, (2) is the valve inlet to the weighing tank. When seated (2) becomes an overflow pipe through which liquid may spill into the weighing tank. When raised, it permits liquid to flow direct into the weighing tank. (3), Fig. 2, is a vent pipe. (4) is a cone to guide the liquid gently to the weighing tank just previous to delivery of the unit charge. (5) is a large U-shaped water-sealed discharge pipe, its upper end (5a) projecting through the bottom of the tank *(B)*. (6) is a vertically movable bell float that envelopes the upper end of the pipe (5a). The float and pipe together form a siphon through which the weighed charge escapes when dumping. Float (6) carries a rod (6a), the upper end of which engages and opens the inlet valve (2) when the float (6) rises. The stored liquid in the upper tank then drops quickly into the weighing tank. (7) is a manometer or "trip" by which the charge is automatically weighed and released from tank *(B)*. (8) is a float-actuated counter that registers the number of charges weighed. (9) is a gage glass. *(C)*, comprising the bell float (6) and the upper part of discharge pipe (5) is an air chamber. This chamber acts as an air cushion while the unit charge is being collected, releasing the unit charge when the air is released by the automatic operation of the trip (7).

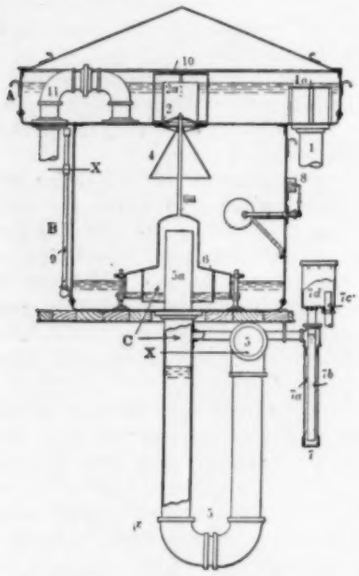


FIG. 1.—VERTICAL SECTION OF LIQUID MEASURING APPARATUS.

When hot water is being weighed two additional devices are employed to prevent steam or vapor entering chamber *(C)* and thereby impairing the accuracy of the apparatus, the first of which devices is an inverted cup (10) carried by the overflow pipe of inlet valve (2). The lower end of the cup (10) is water-sealed when the lower tank discharges, thereby preventing hot vapor being drawn from the upper into the lower tank. (11) is a pipe connecting the weighing tank and the outside air.

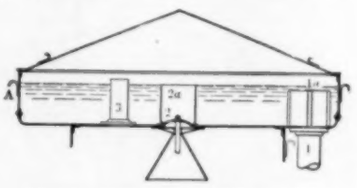


FIG. 2.—DETAIL OF UPPER TANK.

The operation is as follows: Assuming the apparatus to be primed, which consists in filling the U-pipe and the trip to their normal levels, liquid from the inlet enters the upper tank, its level rising to the top of the overflow pipe (2a) carried by the valve (2). Overflowing and passing through the open spider of the valve it enters the lower tank. Bell float (6) in the lower tank rises as the charge accumulates, until the shoulder on float rod (6a) engages and lifts valve (2). Thereupon the stored liquid in the upper tank drops quickly into the lower tank, filling it nearly to the discharge level (x). Liquid from pipe (1) thenceforth flows freely along the bottom of the emptied upper tank, gliding down the cone (4) and quietly adding to the level in the lower tank. Soon the level reaches the height (x) for which the tripping device is adjusted and discharge from the lower tank occurs through the automatic operation of the trip (7).

The effective head in the manometer or trip (7) exactly adjusts itself to and balances this head of liquid accumulating in the lower tank, increasing as the head in the lower tank increases. The balance is maintained through the medium of the air cushion in chamber *(C)*. Releasing the air cushion releases the charge in the lower tank.

The function of trip (7) is to suddenly vent the air cushion when the head in the tank equals the maximum head that can be maintained in the trip. When the level in pipe (7a) of the trip sinks to the bottom of the pipe (7b), Fig. 1, the liquid head in the tank is delicately balanced by a liquid column, exactly equal in height to the vertical distance from the bottom of pipe (7b) to the top of pipe (7c). The slightest addition of head in weighing tank *(B)* spills a few drops from (7c) and destroys the hydrostatic balance. Instantly the air cushion in chamber *(C)* shoots the liquid from (7b) and escapes with it through (7c).

Deprived of buoyancy, the bell float (6) suddenly drops, allowing the valve (2) to seat, thereby preventing inflow to the weighing tank while the weighed unit discharges. The unit charge *(B)* swiftly siphons out through the bell (6) and pipe (5a), escaping through pipe 5. When the level in the weighing tank has sunk to the rim of bell (6) air enters the bell float, the siphon breaks, and discharge ceases leaving the U-bend of the discharge pipe and the trip full of liquid and the level in the measuring tank at its zero point as in the initial condition. An interval then ensues during which the liquid in the tripping siphon and discharge pipe and the residue in the measuring tank comes to rest at normal or zero level, while the next charge begins to accumulate in the upper tank. The process then repeats itself.

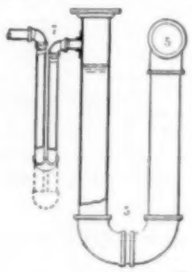


FIG. 3.—MODIFIED FORM OF TRAP.

In the form of trip shown in Fig. 3, the trip is a U-pipe (7a) (7b) capable of swinging around its point of attachment to the discharge pipe. Such adjustment in effect varies the maximum effective head of water column that the pipe may contain and thereby adjusts and controls the discharge level of the measuring tank. The apparatus can thereby be set to discharge any desired weight of unit charge within its capacity.

The average flow through a tank weighing water supplied to a battery of six 350-horsepower Wickes vertical water tube boilers was sixty-three

thousand pounds of water per hour at a temperature close to the boiling point, fluctuating between 205 degrees and 210 degrees Fahr. It operates under a wide range of supply and delivery, and adapts itself to extraordinary fluctuations.

The dimensions of the tank are as follows: The upper tank is 72 inches in diameter and one foot deep. The lower tank is 48 inches in diameter and 3½ feet deep. Height from floor to top of cover, 5½ feet. The discharge pipe projects below the floor 5½ feet.

Numerous trials under actual use as a feed-water weigher showed a maximum error, after four months' constant service, of less than ¼ of one per cent. A temperature fluctuation of ten degrees causes no appreciable error in operation. The error that would naturally be introduced by increase of volume incident to increased temperature is small, and even this small error appears in practice to be offset by expansion or contraction of the weighing tank as the temperature rises or falls.

Chrome-Vanadium Steels.—In a paper read by Mr. J. Kent-Smith to the Liverpool section of the Society of Chemical Industry a few days ago, it is stated that Messrs. Willans & Robinson are now producing special vanadium steel alloys at the rate of 800 tons per annum at their Queensferry Works. The ferro-vanadium used for the manufacture of these special alloys is got from the Llanelly Works of the new Vanadium Alloys Co. in South Wales, and contains up to 30 per cent of vanadium. The vanadium steel industry is altogether an English industry, and 80 per cent of the production is now being taken by the motor car and motor omnibus manufacturers of this country. The highest test yet obtained from a chrome-vanadium steel, after special treatment, was a maximum breaking strain test of 103 tons per square inch, this steel showing at the same time great resistance to dynamic and torsional tests. This is a combination of qualities which has never been obtained before, and is the peculiar feature of the chrome-vanadium steels.

The board of directors of the Detroit River Tunnel Co., a subsidiary interest of the Michigan Central Railway, has been authorized to borrow $15,000,000 for the construction of the double-barreled tunnel under the river. A number of bids have been received, but no awards have been made as certain important features of the work have not yet been decided on. Electrical transmission will be used.

USE OF OXYGEN IN REMOVING BLAST-FURNACE OBSTRUCTIONS.[1]

THE CHEVALIER C. DE SCHWARZ.

All experienced blast-furnace engineers are acquainted with the great inconvenience, anxiety, and even, in certain circumstances, danger caused by the taphole of a blast-furnace becoming closed up by solid iron, so that it cannot be opened by means of the ordinary appliances without a certain lapse of time. There is the danger of the liquid iron accumulating on the hearth of the blast-furnace and reaching the slag and the blast-tuyeres, thus causing serious disturbances and sometimes explosions. It often becomes necessary to make a new taphole higher up, and to reduce or to stop the blast temporarily, which may result in the formation of scaffolds or other serious inconveniences well known to blast-furnace engineers.

The case is still more serious if the blast-tuyeres of the furnace get closed up by solid iron, either partially or entirely, owing to a scaffold dropping suddenly, or from other causes. Should it in such a case be impossible to get a hole through the iron blocking up the tuyeres within a certain time, a new temporary tuyere, at a higher level, must be applied, and even this remedy often does not have the desired effect. There are, in fact, few cases in metallurgical practice where quick and effective measures are of greater importance and more imminently necessary than those mentioned above.

Hitherto the opening of tapholes closed up by solid iron has usually been effected by forcing a hole through the iron by means of a steel bar driven by hand-hammers. If hand methods do not suffice, a heavy "ram," suspended on chains and worked by a dozen men, is employed. However, it sometimes happens that the steel bar snaps off, leaving the broken end in the hole already made, or that the liquid iron cools down in coming out, and solidifies in front of the taphole, thus making matters worse than they were before.

Coke and heated blast, as well as petroleum, are sometimes employed for opening a closed-up taphole or tuyere but these require too long a time to take effect, and, in the case of a tuyere, the latter is, as a rule, utterly destroyed by the operation. A strong electric current of from 400 to 1,000 amperes has also been used for opening tapholes, but this method is similarly open to the objection that it does not work quickly enough, besides which it is very expensive.

The application of compressed oxygen in such cases has completely overcome all these difficulties, as a closed taphole or tuyere can be opened in a few minutes only, besides which the method has the merit of being exceedingly simple and cheap, as will be seen from the following description.

The iron to be burned through (pierced) is first heated from outside, at the spot selected for making the hole, by means of an oxy-hydrogen flame which, up to now, has proved to be the most useful for the purpose. It can, however, be replaced by any other combustible gas in case of necessity.

The hydrogen is allowed to escape first, and is lighted, after which the stream of oxygen is turned on. The pressure of both gases is first kept low, but gradually raised and regulated in such a way as to give a very hot flame, which heats the spot upon which it impinges to a white heat. The pressure of the oxygen is then raised to such an extent that the iron commences to burn, which is shown by sparks being thrown about.

The pressure of the oxygen is now further raised to 30 atmospheres and above, whilst the supply of hydrogen is entirely stopped. It is now the iron alone which burns, thus replacing the hydrogen as a combustible, whereby, as shown hereafter, a degree of heat is developed which far surpasses that produced by means of oxy-hydrogen gas. The high pressure of the escaping oxygen, at the same time, serves to force out all the molten iron, thus keeping the hole burnt through perfectly clean throughout the operation. It can be shown that a solid block of cold iron or steel, say 16 inches thick, can in this way be pierced within one or two minutes.

The heating effect of the oxy-hydrogen flame alone is far too low to serve the purpose of opening closed-up tapholes or tuyeres. This is principally due to the fact that (on account of the comparatively great volume taken up by hydrogen) the loss of heat through derivation is much too large, as compared with iron, taking both, as in our case, as combustible matters into account.

When iron burns in oxygen the heat evolved is concentrated on a comparatively very small area. This explains the enormously high temperature produced, and the quick action, as mentioned before, notwithstanding that, at the same time, a considerable amount of cold is produced owing to the expansion of the compressed oxygen after leaving the steel flask. This shows

[1] Abstract of a paper presented at the London (May 1906) meeting of the Iron and Steel Institute.

itself at the tube leading the oxygen from the flask to the "burner," which becomes coated with ice, the temperature of the tube being only about 14 degrees Fahr. The process, above described, yields remarkable results when employed for opening a blast- or slag-tuyere blocked up by iron, because the great heat produced when iron burns with oxygen might lead to the conclusion that the tuyere in question must be melted away, taking the thinness of metal in a tuyere into consideration. This, however, is not the case. Experience has shown that, for instance, a slag-tuyere of only 1⅜ inch inner diameter can be thoroughly cleaned from all the iron adhering to it without being injured in any way. The tuyere does not get heated at all, but cools down, considering that the temperature of the oxygen, coming from the tube, is, as already stated, reduced below freezing-point owing to expansion.

The oxygen process has been successfully applied for opening tapholes of open-hearth furnaces where they have become blocked up with iron or steel. It is of great importance that no delay should occur in tapping an open-hearth furnace as soon as the liquid metal has reached the desired degree of decarbonization, as otherwise its composition might change, owing to the delay, to such an extent as to render it useless for the desired purpose.

The new process overcomes difficulties of this nature in a few minutes.

Experiments are also being made as to the employment of the new processs for improving steel ingots by removing the "pipe" caused in the upper portion owing to shrinkage during cooling. The crust of solid steel or iron above the pipe is burnt through in the way already described, within less than a minute, and superheated liquid metal of the same quality as the rest of the ingot poured in. This thoroughly fills up the pipe. The experiments are not completed as yet, but the results so far obtained seem to promise final success.

The oxygen process has also been successfully employed in removing dead-heads or runners on steel castings. This is of special value in cases where the hardness of the steel casting is such as to resist the action of cutting the tool at the place where the dead-head or runner is joined to the casting.

In rolling mills, where interruptions of work are very costly, the oxygen process can be advantageously employed in melting through and quickly removing any broken shaft or axletree from couplings, flywheels, etc., instead of causing long delay and expense in doing this work by means of chisels and drills.

The oxygen process has also been successfully employed for piercing armor-plates for warships and armored turrets. This is of special importance in case such plates are of hard metal. A hole through such a plate of, say, 9-inch thickness, would require two or three hours if drilled in the ordinary way, whilst with compressed oxygen this work can be done within 15 to 20 seconds. This remark applies also to the manufacture of hollowed weldless steel goods, either pressed or cast, especially if hard steel is used where the driving in of a treblet might spoil the article in question.

Whilst, as already mentioned, oxy-hydrogen has proved the most convenient for producing the necessary initial heat, before applying the oxygen gas alone, in order to open blocked up tapholes or tuyeres in furnaces, the electric current has proved more convenient for the same purpose if armor-plates, steel castings, etc., are to be pierced. A current of from four to six volts and 200 to 220 amperes is quite sufficient to produce the necessary initial heat before applying the oxygen.

The oxygen process above described was invented and first practically applied by Dr. E. Menne, engineer to the Cologne Musener Bergwerks Aktien Verein at Creuzthal in Westphalia. Some improvements have been effected and carried into practical operation by the Societe Anonyme Oxhydrique Internationale at Brussels for cutting boiler plates, tubes, etc., so quickly and accurately that the oxygen process has secured favor as a trustworthy method for this purpose. The arrangement consists essentially of two tubes which can be placed one behind the other, the first tube supplying oxy-hydrogen gas, and the second oxygen gas. The oxy-hydrogen heats the plate up to a white heat, and the compressed oxygen burns (cuts) the plate exactly as desired. The apparatus for guiding the two tubes works in such an easy and exact manner that the slightest pressure of the finger-tips suffices to guide it as desired.

Finally, it may also be permissible to take the financial outlook of the oxygen process into consideration. The principal outlay is that for the oxygen gas. For opening a blocked-up taphole or a tuyere, as a rule, not more than eight or ten cubic feet of oxygen are required; in exceptional cases, however, from twenty to forty cubic feet of oxygen gas are necessary. The apparatus itself is very simple and inexpensive. It consists of two steel flasks, each with a reducing valve, and of a few yards of iron tubes and armored hose. Several blast-furnace works in England, Germany, Austria, France, and Belgium have already adopted the process, with satisfactory results.

OHIO ENGINEERS MEET AT PITTSBURG.

The twelfth meeting of the Ohio Society of Mechanical, Electrical and Steam Engineers was held at Pittsburg May 18 and 19, with about 30 members in attendance. The Ohio Society was the guest of the Engineers' Society of Western Pennsylvania, and the sessions were held in the handsome new quarters of the Pennsylvania body. The opening session Friday was devoted to business purposes, after which papers on "A Pound of Water" by Geo. G. Bennett, of Cleveland, and "Air Lift Pumping" by Gustav C. H. Friederich, of Wheeling, W. Va., were presented. A visit to the Phipps power plant consumed the remainder morning. In the afternoon the society visited the works of the Westinghouse companies, and made a careful tour of these plants.

The Friday evening session was given over to a discussion of "Methods of Testing Interurban Railroad Systems," Prof. E. H. Hitchock, of the Ohio State University, presenting his own discoveries and those of Prof. F. C. Caldwell in that connection. William M. Davis, of Sheridanville Pa., discussed "Economical Lubrication of Large Plants."

In the absence of their authors, the papers on "Shop Kinks" by Willis A. Holloway, of the Jeffrey Mfg. Co., Columbus, O., and "Gas Engine Driven Railroad Cars" by E. W. Roberts, Clyde, O., were read by the secretary, F. W. Ballard, of Cleveland. The concluding paper of the session which was presented by J. R. Bibbins, of the Westinghouse Machine Co., carefully considered "The Gas Engine Power Question." This paper was illustrated with a number of photographs and charts. Mr. Bibbins made the point that the gas engine is not an experiment, but is in highly successful operation as illustrated by numerous installations. The producer gas plant, he stated, was the most promising. President Magruder of the society briefly discussed Mr. Bibbins' paper, and said that the claims which it made for the gas engine were extremely moderate.

Saturday afternoon the society inspected the new plant of the South Pittsburg Water Co. Twenty-one new members were elected. The next session, which is the annual meeting, will be held at Akron, O., Nov. 16.

The Annual Meeting of the Iron & Steel Institute in London.

(Special Correspondence.)

London, May 12.—The annual meeting of the Iron and Steel Institute was held at the Institution of Civil Engineers, St. George street, Westminster, on Thursday and Friday, May 10 and 11. The president, R. A. Hadfield, was in the chair. There was a large attendance, including the following members of the council: Rt. Hon. Victor Cavendish, M. P., Sir W. Lewis, Bart., Sir James Kitson, Bart., M. P., Sir Alfred Hickman, Bart., and Messrs. Illtyd Williams, J. M. While, G. Ainsworth, Wm. Evans, W. H. Ellis, W. H. Dixon, J. M. Gledhill, David Colville, Andrew Lamberton, A. T. Tannett-Walker, W. Beardmore, Arthur Keen, E. Windsor Richards, E. W. Martin, James Riley, Arthur Cooper, J. E. Stead, with W. H. Bleckly and Bennett H. Brough. The special members included the following: Sir Hugh Bell, E. J. Ljungberg, (Sweden), E. Coppee, (Belgium), Prof. H. Bauermann.

R. A. HADFIELD.

ARTHUR KEEN.

J. M. GLEDHILL.

SIR JAMES KITSON.

The handsome well-appointed building with its ample libraries, its pictures of celebrated engineers and its store of scientific lore was well suited to the meeting.

Tribute to Sir David Dale.

The chairman said he had the mournful duty of asking the institute to confirm the resolution of condolence passed upon the council of the late Sir David Dale's family. The institute had sustained a very heavy blow. Sir David had for many years taken the greatest possible interest in its affairs. He was one of the original five men who founded the society which had now grown into an organization of such magnitude and importance. For thirty years he held the position of treasurer, and only gave up to become president in 1895. Personally, he (President Hadfield) should always remember the way in which Sir David behaved to him at the Birmingham meeting, and many of those present had personal experience of his remarkable control of millions of capital for, as they knew, he was one of the most prominent iron and steel members in the north of England. They would remember also the admirable way in which he acted on many occasions as arbitrator and conciliator, which showed the great position he held. The members would express their approval of the resolution by standing in silence.

The meeting responded by rising in a body. The president invited a similar expression in regard to one of its illustrious past-presidents, Josiah Smith, who, although not for some time a very active member, took a warm interest in its proceedings. This appeal was similarly responded to.

SIR ALFRED HICKMAN.

The president announced that he had appointed Messrs. B. J. Broadway, (Birmingham) and J. W. Wainwright, (London), as scrutineers of the ballot list.

The report of the council having been read by the secretary, Mr. W. H. Bleckly, treasurer, read the financial statement and moved its adoption. The balance sheet showed entrance fees amounting to £407 8s. Annual subscriptions £4,078 4s. Income tax recovered (4 years) £132 6s 4d, and other receipts bringing up the total to £6,271 11s 10d. The expenditures included salaries £1,308 16s 8d; autumn meeting Sheffield £231 7s 8d; "Journal" publishing expenses £1,743 14s 7d; and Carnegie scholarship fund £607. There was a balance of income over expenditure of £747 10s 1d in the general fund and in the Carnegie fund £266 13s 7d, a total of £1,014 3s 8d. The accumulated invested funds amounted to £9,323 9s 2d.

The treasurer preceded his reference to the figures by a personal tribute to Sir David Dale, expressed in terms of highest regard. He stated that he well remembered his opening address in 1870 on the financial position of the institute, there being then a deficit of £42 5s 9d, which Sir David explained was due to a special expenditure. When he presented his last balance sheet in 1895, the balance was little short of £8,000. His great ability was all the more conspicuous in the presidency of the institute, and during the two years he held the office he had guided its affairs with marked wisdom and success. Afterwards, his ability was always at the service of the institute, and he took great interest in its finances. He was personally indebted to Sir David for valuable advice and assistance, and by his death the institute lost a staunch and able supporter.

It should be a long time before its debt of gratitude should be forgotten.

Reason for Congratulations.

The treasurer said he had to congratulate the institute on the flourishing condition of its affairs. The work of the institute was appreciated not only by those engaged in the manufacture of iron and steel, but by friends all over the world interested in the innumerable problems, metallurgical, geological, chemical and mechanical, associated with the industry, and which were continually arising. The income of the institute was £6,271, compared to £5,903 the previous year and its expenditure was £5,257 against £5,727, leaving a considerable surplus in hand. The annual subscriptions had increased from £3,931 to £4,078, and the life compositions from £63 to £252. A very important saving had been effected through the fact that the Sheffield conference although the most successful

SIR LLOYD WISE.

and the best attended in the annals of the institute, cost only £231 against £731 expended on the one in the United States. The large refunding of income tax had been of great assistance. The income from the Carnegie scholarship fund, which in 1904 proved insufficient to meet the expenditures, by reason of which there was a balance on the wrong side of the ledger of £740, this year showed, thanks to Mr. Carnegie's welcome donation, a substantial surplus which would go to increase the present year's income. The expenditure on the Carnegie scholarship fluctuated from year to year, according to the grants made by the council and it was well to take into consideration the fact that the expenses of translation and printing varied from year to year. The report was adopted, and in accordance with the general desire of those present, the president announced that, in the future, the financial report would be circulated before the meeting.

Thanks to Officers.

Sir Lloyd Wise moved that the cordial thanks of the institute be tendered to the president, the honorary treasurer, the secretary and the council, for their services during the year. "The institute is," he said, "a great institution, which has as its object mutual instruction and development, and the gratitude of the members towards the officers should not be measured by words. The prosperity of the institute depends essentially upon the efficiency of the officers, especially upon that of the secretary. As time passes, and officials die, their departure is deplored, but the institute has been fortunate in having gaps filled by men as capable as those who have gone, and the institute is proud to have at its head men of great distinction and knowledge, and who had attained much knowledge in the way of scientific research." J. Rossiter Hoyle (Sheffield) seconded. They, in Sheffield, he said, all knew how great a share of the work had been done by the president. Apart from the secretary, he wondered how he did so much work, but he somehow came out on top. The motion was carried by acclamation.

The president acknowledged the compliments to himself and colleagues, and said that theirs had been a labor of love. They hoped to have a very successful meeting in July, and expected a record attendance. They were expecting to have a large representation of American friends with whom they would be able to exchange views of benefit to all concerned. He was glad to know that the comments he ventured to make at the Sheffield meeting, as to the probable future of the iron and steel industry, had so far been justified by events. He then expressed the belief that the times were getting better. The facts had proved this to be the case. The enormous output of iron and steel in America continued to be increased. A record of 2,165,000 tons in a single month represented a production of 26,000,000 tons of pig iron per year. England also was doing well, he said. He referred to the announcements in regard to the new plant of the Steel Corporation at Gary, Ind., which, he said, almost took one's breath. He understood that, when completed there would be 16 blast furnaces and 84 open-hearth furnaces. The rolling capacity would be 1,000,000 tons per annum. He trusted that the institute's membership would continue to grow on the present gratifying scale. The secretary then read the following report:

Carnegie Research Scholarships.

Having carefully investigated the fifty applications, the council of the iron and steel institute recommended that grants £50 each should be made to:

H. C. Boynton, (United States;) L. Guillet, (France); W. H. Hatfield, (Sheffield); that grants £25 each should be awarded to: E. G. L. Roberts, (London); W. Rosenhain, (Birmingham); and E. A. Wraight, (London); and that a grant of £40 should be awarded to: A. Campion, (Glasgow).

The council also recommend that scholarships, each of the value of £100, should be awarded to:

C. A. F. Benedicks, (Sweden); O. Stutzer, (Germany); E. Hess, (United States); and E. F. Law, (London).

Having carefully considered the reports submitted by last year's research scholars, the council recommends that the Carnegie gold medal be awarded to L. Guillet, (Paris), and that a special silver medal be awarded to W. Rosenhain, (Birmingham). The reports submitted by H. C. Boynton, (United States;) J. Dixon Brunton, (Musselberg); W. H. Hatfield, (Sheffield); and

LEON GUILLETT.

E. G. L. Roberts and E. A. Wraight, (London); are considered to be of sufficient merit to justify their publication in full in the journal of the institute.

Careers of Recipients.

The following are notes of the careers of the recipients of Carnegie scholarships for 1906:

Henry Cook Boynton studied for four years at Harvard University and afterwards assisted in the metallurgical department of the university. He has contributed numerous accounts of his investigations to the technical papers in the United States.

Leon Guillet was educated at the Central School of Arts and Manufactures of Paris and at the University of France. He is a doctor of science and an engineer of the School of Arts and Manufactures. He is superintendent of the laboratories of the Dion Bouton works at Puteaux, consulting engineer of the Metallurgical Society of Bonneville, and professor of metallurgy at the College Libre des Sciences So-

ciales, Paris. He has written several treatises on special steels and alloys, and receives the Carnegie gold medal.

William Henry Hatfield studied for four years in the metallurgical department of Sheffield university, where he took the associateship, and numerous prizes. He is now metallurgist to Messrs. J. Crowley & Co., Ltd., Sheffield.

Edwin Gilbert Llewelyn Roberts was for two years a student of the city and guilds of London institute, and subsequently of the Royal School of Mines. He was for some time engaged in the erection of mill engines by Messrs. Galloway's Ltd., and is now demonstrator in metallurgy at the Royal School of Mines.

Walter Rosenhain was educated at Wesley college, Melbourne, where he graduated as a bachelor of civil engineering with first class honors, and later studied for three years at Cambridge under Professor Ewing. He is chief chemist and scientific advisor to Messrs. Chance Bros., Ltd., Birmingham. He receives the Carnegie silver medal.

Ernest Alfred Wraight was educated at St. Olaves grammar school and at the Royal School of Mines. He was for some time in the laboratory of the Indian government at Cooper's hill, and is now assistant assayer at the Royal mint. In 1903 he was awarded the Matthey prize by the board of education for researches on segregation.

Alfred Campion was for three years a student at the city and guilds of London institute, and subsequently assistant to the professor of engineering at the Royal Indian Engineering College, Cooper's Hill. He was for some time chief chemist and metallurgist to the Steel Company of Scotland, and for four years was chief assistant analytical chemist at Cooper's Hill. He is secretary of the west of Scotland Iron and Steel Institute. He received the Carnegie gold medal in 1903.

Carl A. F. Benedicks is a doctor of philosophy of the University of Upsala, where he is lecturer in physical chemistry. He has had considerable practical experience in metallurgy and in electro-smelting.

Otto Stutzer was educated at Bonn and Breslau, and at the Universities of Konigsberg, Tubingen, Munich and Heidelberg. He is at present assistant professor of geology at the Royal School of Mines, Freiberg, Saxony.

Edward Hess was educated at Columbia university, New York, where he has carried out investigations under the supervision of Professor Howe.

Edward Fulton Law received his metallurgical training at the Royad School of Mines of which he is an associate. He afterwards became assistant to the late Sir Wm. Roberts-Austen at the mint, and is now practicing as a consulting metallurgist.

Bessemer Medal Presented.

The president said it was now his very pleasant duty on behalf of the Institute to extend an honor to the great Frenchman, Mr. Floris Osmond, who was a representative of the wonderful French accuracy and devotion to research, which men in this country could well imitate to a greater degree. Mr. Osmond was one of the greatest authorities in the world on the diagnosis of steel and its peculiarities, and he had, personally, benefited very greatly from his pleasant and friendly relationship with Mr. Osmond. His own correspondence with the great Frenchman totalled hundreds of letters commencing as far back as Oct. 2, 1889. In making the presentation of the Bessemer gold medal, the speaker also complimented other great Frenchmen. Unfortunately, Mr. Osmond was not able to be present to accept the medal in person. The president said he was glad to refer to the Terre Moire band of workers which did such work in the early days of steel castings in special alloy and special steels, and especially to Mr. Henri Schneider. They would join with him in regretting the great loss his firm had sustained by the sad accident which resulted in the death of Mr. Gluy. He was always a warm supporter of the Institute. They were glad to add the name of Mr. Osmond to the list of those held worthy of the medal. He had placed the world under a debt of gratitude by his study of crystallography and metallography. They hoped he would long live to continue the work. The president then made the remaining presentations, mentioning the fact that Mr. Walter Rosenhain came from Australia and that his Colonial work was highly appreciated.

Compression of Steel Ingots.

The reading of papers followed, the first read being on "The Compression of Steel Ingots in the Mold," by A. J. Capron, (Sheffield).

J. M. Gledhill, (Manchester) opened the discussion, and remarking that he thought this one of the most practical papers brought before the Institute for a long time, and he could endorse from experience the statement that the method would be attended by considerable advantage. It was curious that the idea of fluid compression of ingots had at last attracted attention. His own firm had been doing that kind of thing for thirty years, yet Mr. Capron's paper seemed to be the first heard on the subject. His firm had not said much about it for obvious reasons. He was glad to find, remembering the hospitality they had received from Sheffield, that their friends there were finding salvation and were getting on the right track of making the ingots in the proper way. It was never too late to mend. But they at Openshaw had not been able to make a success of the particular method of compression recommended in the paper. There was an advantage in dealing with steel in the plastic state. They got homogeneity, regularity and freedom from cracks in the ingot. The largest they had cast weighed 120 tons. These were 6½ feet in diameter by 20 feet long, and were subject to a total pressure of 12,000 tons. In dealing with circular shafts, they did not cast their ingots in chills. Where they had to make circular work, like gun forgings, it was better to cast the ingot in the form in which it was desired that the finished article should appear. The corners produced lines of segregation and sometimes they got ghost-lines. They had found that the compression method had considerably reduced the waste.

Mr. W. H. Ellis of Sheffield, stated it was a strange coincidence that the president should have called upon him, seeing that his old master had just spoken. As to the backwardness of Sheffield, referred to by Mr. Gledhill personally, he had not experienced any such remissness in adopting new methods. He had had considerable experience in the working of ingots made by Mr. Gledhill's process, and as regards the perfect exterior surface, he had never seen better. They were absolutely uniform and most satisfactory. At the same time those who delayed adopting the improvement would not be the losers in the long run. There was some doubt as to whether the same uniformity would be gotten under the Herme system as under the Whitworth system. He congratulated Mr. Capron on bringing so interesting a subject before the Institute, but the question of pressure was a serious matter. Taking the usual pressure two and one half to three tons to the square inch, that would mean that a 36-inch round ingot by the Whitworth or Herme process would require a 2,500 to 3,000 tons press to produce satisfactory results. If manufactured by the process described in the paper, they would want a pressure of from 12,000 to 13,000 tons, thereby involving much larger expenses in the way of plant. It would have been useful to have had some analyses before them, especially as it seemed that the worst samples had not

been obtained. Some samples should have been obtained containing some sulphur and phosphorus. Then there would be something to liquate. The ingot taken had very little sulphur, consequently, the liquation was proportionately small. As he was an engineer and not a steel maker, he welcomed the fact, further demonstrated, that the bringing together of the two professions of engineering and metallurgy would be a benefit to both, and they should seek to increase the good fellowship between the two.

Mr. D. Colville, of Motherwell, said he had the pleasure of working fluid compression of steel that had been described. He thought that the presses of Messrs. Hobson and Rodger came within the scope of practical manufacture of heavy steel plate, and it was in that direction they must look for special developments of large quantities of steel and iron. It might not be available for highly saturated carbon steel, but for improved steel plates. It would come in very beneficially for the steel maker. For a steel especially melted in a mold three feet by four feet and fifteen inches thick, the pressure applied to effect a reduction of even an inch in thickness would be as great or even greater than the effect of cogging from a large, thick ingot, and the system commonly adopted involved a heavy loss from the fact that in casting large thick ingots segregation took place to a serious extent. To make absolutely sure of the plate, they were required to cut off quite one-third of the ingot as being unsound. Messrs. Jessop's process was admirably adapted for so taking the liquid in the mold as to prevent splashing on the walls of the mold, thereby insuring a perfect surface for the ingot.

Mr. Beardmore considered the paper one of the most important read before the Institute for some time. The question of fluid compression of steel seemed to be rather a choice of method, as between the one carried out for many years by Messrs. Armstrong and by Messrs. Hearne. The latter process seemed to be most scientific and generally the best method. At his iron works, he had for two years been casting most of his ingots by the Hearne method, and the results obtained had been entirely to his satisfaction. When he told them that he could, beyond any doubt, cast ingots of 25 to 30 tons in weight absolutely sound from bottom to top without even a blow hole the size of a pin head, they would agree that the Hearne method had worked extremely well. In his own opinion, it was the best method known to engineers. His own impression was that if the system was worked thoroughly well by people in the plate trade, the chances were that the cogging mill would be entirely dispensed with. Instead of casting ingots and taking them to the cogging mill and roughing them down to a slab before rolling they would dispense with the mill, and so reduce the cost of the steel. That was the striking issue of the paper.

Prof. McWilliam, of Sheffield, said that if they once admitted that the Whitworth process was the pioneer, that should not be compared to the Wiesen process absolutely without consideration of the fact that it had been going on all these years. It was said that the system was for the prevention of blow holes, and he was pleased to hear nowadays that it was considered that blow holes should be prevented in the furnace. One opinion he personally welcomed was that the metal should be so treated in the furnace that there should be no blow holes. If they could always assure that the flow was in the top of the ingot, it was practically the ideal thing, but if they were to have an ingot so perfect as to abolish waste, he could not help wondering what would be the price of scrap in the future. It certainly would be bought at a very high price.

F. A. Lart, (Darlington), said that sometimes in Germany 7,000 tons of steel plate passed through his hands, thirty feet long by four feet wide and all those plates were rolled from ingots three and one half by two and one half feet. He had not a single failure and the plates were extremely satisfactory in regard to surface and tensile strength. As to the suggested abolition of cogging, it was possible in the case of the larger ingots. The smaller ones could not be similarly treated.

Mr. Ellis thought it would be valuable if mechanical tests could be given showing the difference in the result from pressing ingots as compared to what they were before they were pressed. That would improve an already valuable paper.

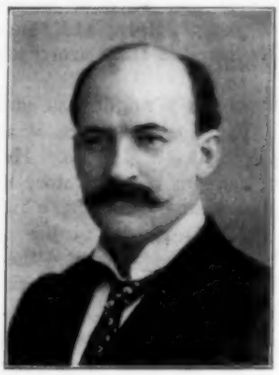
Andrew Lamberton of Coatbridge thought that the suggested abolition of cogging was the most interesting result predicted, involving nothing short of a revolution, but they would want a very large field adjacent to the works for the storage of molds because he imagined the latter would have a very high mortality through cracking and breaking. He would like to know what Mr. Capron thought about the suggested abolition of cogging. Personally he did not desire to retain the system a day longer than was necessary. Mr. Colville explained that he did not think cogging would be dispensed with because the system was applicable only to large plates.

James Riley of Stockton-on-Tees said that he had seen the utility of steel compression in certain directions, but in some cases it furnished a large percentage of scrap, the very reverse of what Prof. McWilliam had said.

Mr. E. H. Saniter of Rotherham pointed out that in casting big ingots they got a thin skin on one mold cracked by hydrostatic pressure. None of the systems of compression brought forward touched that point at all. He did not see how these skin cracks could be prevented which were produced

W. BEARDMORE.

JAMES RILEY.



PROF. A. McWILLIAM.

when the steel was at all hot. Still he thought the compression method good and useful and a very valuable addition to the systems in use. Mr. Gledhill said that he would be glad to show the last speaker thoroughly sound castings of any size desired.

Mr. Capron, replying, explained that the system could be applied advantageously both to large and small castings, but he did not agree that the cost would be disproportionately great for large castings because of the great pressure. The cost of the plant would be in favor of the horizontal type of press. It was an extremely compact and simple style of machine, as the component parts are comparatively simple and the increase of size would not add much to the cost of the pumping arrangements for producing compression. As to the suggestion that he had dealt only with high class steel, he had used the steel required in every day work, which in his case was almost entirely crucible steel. As to further tests being required, the photographic test showed the improvement in the texture while the quenching test showed hardly any failures, and they were all applied to the top end of the bar made from the ingot. As to particular sizes of slabs required of ordinary plate rolling, that had been considered in connection with rolling of ship and other plates, the conclusion arrived at was that the difficulty could be to a great extent gotten over by casting a slab of considerable length and of such a section as could be dealt with in a plate mill. As to the life of the ingot molds, his experience was that they lasted very well, and he could show a mold in which two hundred ingots had been cast and which was still in use.

The President tendered very hearty thanks to Mr. Capron who had every reason to be satisfied with the discussion that followed his paper.

Cooling of Cast Iron.

Prof. Turner's paper on "Volume and Temperature Changes During the Cooling of Cast Iron" having been read, J. E. Stead said that the machine used by Prof. Turner seemed to give very reliable results, but that he was struck with the enormous difference between phosphoritic iron and gray hematite, and he would be inclined to doubt its accuracy unless repeatedly confirmed by analysis. Mr. Stead continuing, said they had phosphoritic iron expanding to a much greater extent than gray iron of a similar silicon content. Looking at the ordinary diagram and the curve of the white iron, they saw what an enormous influence graphite played in expansion. Probably the explanation was found in the separation of the graphite. They knew it did separate all the way down, and the higher the silicon the more the separation occurred. He congratulated Prof. Turner on the very perfect machine he had developed. He did not know whether it would tell them the composition of the metal. He hoped that it would.

Prof. Turner, replying said he hoped Sir Thomas Wrightson, Bart., M. P., and others would contribute to the discussion. He did not anticipate that the machine would do away with the work of the analytical chemist, but it enabled one to form a general idea of the composition of the metal at a glance. Thanks were heartily accorded Prof. Turner.

The Influence of Silicon.

Mr. W. G. Adamson's paper on "The Influence of Silicon" having been read, Prof. Turner said that the paper was very suggestive and he cordially agreed to the statement that the determining factor in the strength and physical properties of iron was ordinarily the amount of combined carbon. Graphite was an accidental impurity distributed through the metal. The combined carbon had a decided effect on the density and brittleness of the metal. Mr. Adamson attached considerable importance to the varieties of graphite. Personally he had tested this to considerable length some time ago and he knew of no more simple method of determining the physical properties of iron than by determining the physical properties of graphite. He had taken iron of various compositions and actually extracted graphite, purified it, passed it through sieves of various sizes, and by knowing the proportion going through the sieves he could ascertain the defects of the iron. The smaller the graphite that would pass through, the stronger the iron. Speaking generally, he agreed with the author that they required a certain proportion of combined carbon. The proportionate graphite must be in the finer form if they were to have tensile strength. There were recent researches pointing out that with increased phosphorus they got decreased carbon. If it were true, then it followed that phosphorus was the decarburizing element. The indirect action of the phosphorus was to soften the iron by turning out the carbon, but that was true only to a limited extent.

JOHN E. STEAD.

Mr. Stead said that in Mr. Adamson they had one of their younger members who was very enthusiastic in research work. The paper contained suggestions very pertinent to the question raised by Prof. Turner as to the role played by phosphorus. In his own paper he had drawn attention to the fact that at a certain point, representing 15 to 16 per cent of phosphorus practically the whole carbon was thrown out, but they must assume that while the phosphorus threw out some of the carbon, it made the remainder phosphite and so increased the hardening of the particles distributed through the gray mass. The amount of graphite in the intervening spaces was practically the same in hematite. Founders generally liked a little phosphorus in pig iron and did not like pure hematite. The very important matter referred to was a curious fact that although they might have two pig irons practically the same in composition, metals might yield quite different mechanical qualities. It seemed to be due to something that the chemist did not understand. No doubt it could be eventually explained. Sheffield people talked about the body of pig iron. He would call the elusive something about the pig that they did not understand, the soul of the pig. It was due to something they had not yet discovered and could not identify. The Carnegie scholars might take it up very profitably. It required very long and careful research.

Vaughan Hughes, (Birmingham) wished to know whether the author had applied the annealing process to his work. Prof. Bauermann said he would like to have a much clearer idea what amorphous graphite was. It appeared to him a contradiction in terms, unless the author meant that it was a finely granulated graphite suitable for pencil making, as contrasted with the one they got from Ceylon, but he could not help thinking that amorphous graphite was not graphite at all, but ordinary carbon not crystallized—a carbonaceous substance such as was obtained in anthracite. Some obtained from mountainous regions were decidedly graphitic in the sense that they had pronounced heat and electric conductivity which other coals had not, unless heated. They did not get it to any considerable extent until they raised it to the temperature of,

say, molten zinc. It would be better to talk of it as carbon and say amorphous carbon rather than amorphous graphite.

Prof. Turner agreed that it was difficult to draw the line sharp of where graphite ends and amorphous carbon begins, but the distinction was that whereas amorphous carbon was black and rubbed smoothly in the hand, graphite was gray and rough, but one gradually passed into the other. Mr. Stead said that his own tests sometimes left him uncertain whether to call the particles carbon or graphite. Mr. Adamson replied, agreeing that the something in pig iron which chemists have not identified would be a very good subject for further research. He doubted whether he could give Mr. Hughes the further tests asked for. Most of the iron went to the scrap heap between 1904 and 1905. Thanks were tendered to the author of the paper and conference adjourned to Friday at 10:30 A. M.

Friday Morning Session.

Resuming on Friday morning with President Hadfield in the chair, the reading of papers was continued, the first being the one entitled "The Influence of Manganese on Iron," by Prof. J. O. Arnold. Leon Guillett, (Paris) delivered a lengthy speech in French, which Mr. Brough, the secretary, briefly translated and summarized. He stated that the speech itself will in due course appear in the *Transactions*. The speaker regretted an error which had appeared in one of his tables through the carelessness of the printer. Referring to the distinction between his own conclusions and those of Prof. Arnold, Mr. Guillett said that in the steel he referred to, there was little or no silicon, and it was, therefore, easier for martensite to be present. Mr. Guillett expressed his great appreciation of the Carnegie medal awarded to him.

F. W. Harbord (Englefield Green) thought the paper was a somewhat premature publication. The professor would have done better to have waited until he had verified his researches. He had raised the point that Mr. Guillett had not taken into consideration the question of silicon, but it had been clearly proven that silicon up to 1.6 per cent had no effect in decreasing elongation or increasing area. If anything, its effect was in the softening direction. He was amused at the professor exactly instructing them how to make their pots, but almost expected to hear him add the dragon's blood ingredient and the particular incantation to be said during the process of manufacture. His claim to be the first to be able to make low carbon steel was rather strong. Perhaps it was a joke. It was a well known fact that if they had over-oxidized steel and then took a Swedish bar and melted it down in the pot without any addition of oxidization, it would be red-short. The results of the composition were most irregular and far inferior to the results obtained by Mr. Hadfield. If he had obtained the help of Mr. Hadfield's melter, probably he would have done much better, but the speaker thought he ought to start afresh, making his bars before recommencing his tests. It reminded the speaker of a discussion at a church congress where it was said that they had spent about £12,000 and had succeeded in converting one girl who was of weak intellect. Prof. Arnold had spent a lot of money and had succeeded in producing a great number of bars of heterogeneous quality.

Prof. McWilliam (Sheffield) said that with regard to the influence of silicon on steel everyone would appreciate that fact who had attempted the hardening of steel. Carbonists were well aware of the

PROF. J. O. ARNOLD.

enormous influence of carbon, but with silicon they had to begin afresh. Mr. Guillett had on his head the responsibility of the wasting of many hours of their students in addition to much labor. The gray matter of their brains could be better employed than in detecting errors in Mr. Guillett's tables. In view of the vast progress made in America, as shown in the figures given by the president, they would all want their energy to meet the onslaughts of that terrible American army. At present the tables said one thing and the curves another. Prof. Turner said he had seen oxides such as those exhibited in commercial steel, with much larger magnifications. Prof. Bauermann remarked that with reference to the non-uniformity as to the Nos. 944 and 906, apparently from the evidence, it would almost seem as if the diffusion was regularly making the third or middle example practically the arithmetic mean of the two ends. It seemed possible that some useful results might come out of this investigation.

Mr. Stead said the paper was really the introduction to something which promises to be of great importance hereafter. It was premature, therefore, to discuss the question of manganese until the research was more fully completed. The professor had stated a certain quantity of ferrous oxide, but he did not say how the amount was determined, and it was difficult to determine the amount of the dissolved oxygen in steel. Mr. Stead stated that he was carrying on some experiments in regard to hydrogen in his own laboratory, but the breaking up of ingots in a peculiar way was very well known to those who had attempted to roll over-blown steel or steel to which no manganese had been added. The appearance of the photograph was one with which many gentlemen in the room were very familiar. He would like to know how the amount of oxygen was determined in this case. As to the question of liquation, that should be taken as meaning what the results indicated, but liquation might mean that the materials were not properly mixed. He wished to know if the professor was satisfied that there was no separation in the crucible. If they were properly mixed, the results had a certain scientific value on their own account. It would be wrong to take those results without analysis, but there was a large amount of work to be done and some time must elapse before they got definite results.

In justice to Prof. Arnold he ought to point out to Mr. Harbord that Prof. Arnold did not say that silicon was a softener. What he said was that it did not harden.

Mr. Harbord explained that what he said was that the influence of silicon came in increased elongation and reduction of area. Mr. Stead remarked that that was rather different, but anyhow, when the results were completed they would be in a better position to discuss the whole question.

The speaker next called attention to a forthcoming meeting of the International Association for Testing Materials, of which he is the English secretary. A meeting is about to be held, at which several important papers are to be read, and Mr. Stead appealed for new members to join. He explained that the entrance fee to the society is six shillings.

Prof. Arnold, replying, emphasized the hope expressed by other speakers that Mr. Guillett would clear away the discrepancies with which his works abounded. Dealing with the effect of silicon, the speaker said that the influence of 0.3 per cent of silicon, so far from softening, raised the registered stress of steel from 57.8 tons to 63 tons. Certain figures given by Mr. Guillett were rather irrelevant, seeing that they dealt with nickel, but his own conclusions were that where they had marked brittleness, it was due, not to the presence of silicon, but to the absence of oxygen. Mr. Harbord had a

habit of criticizing a paper first and reading it afterwards. He made no claim to produce a low carbon for the first time. On the contrary, he referred to crystals used for sixteen years. As to the comparison with over-blown steel, the bars behaved very like Bessemer steel bars examined many years ago, which had a minimum content of 2.5 per cent oxygen. As to liquation, whether it was actual liquation owing to incomplete mixing, or liquation in crystals, they could not be quite certain. On the initiative of the president, the authors of the paper were warmly thanked.

The Use of Oxygen.

The paper on "The Use of Oxygen," by Mr. Schwarz, was next read by the secretary, Mr. Bennett H. Brough. Mr. Vaughan Hughes inquired whether it was not possible to substitute acetylene for hydrogen. He had seen some capital blow pipe work during the past few months, and for many purposes it was extremely useful.

Mr. Arthur Richards said he had a tap hole stopped and by the means of oxygen it was opened in 35 seconds. William Hutchinson (Bilston) said that once or twice he had had a furnace blocked for several days and he had liberated it up to a height of 40 or 50 feet. He welcomed with great pleasure such a useful instrument, which might prevent a long stoppage. Dr. Menne (Westphalia), described as the inventor of the oxygen process, having addressed the Institute in German, Mr. Brough gave a brief resume of his speech. It was quite possible, the doctor said, for acetylene to be used, but the best work was not done with a hot flame, but with cold oxygen, which had a temperature of 20 degrees C. He had made experiments with illuminating gas and electricity and considered it immaterial which method was used, as similar results would be obtained. He had tried petroleum, but the operation lasted several hours and there were other disadvantages.

Blisters in Steel Sheets.

The last paper read was the one by Mr. Edward F. Law, entitled "Brittleness and Blisters in Thin Steel Sheets." Dr. Guillett opened the discussion, which was translated by Mr. Brough. Pearlite and nitrogen, he said, both had the effect of rendering sheets and plates very brittle. Alexander E. Tucker (Birmingham) said that some years ago he had investigated the blistering of some tin plate sheets. He had come to the conclusion that it was entirely a question of oxide in the metal. Hundreds of tons of steel developed cracks and in some cases they could put their fists into the fissure. In other places the ingots went to pieces in the rolls. Chemical analysis failed to elucidate the matter. The silicon happened to be high and the manganese normal. By determining the amount of oxygen he was quite satisfied that it was a question of oxide.

Influence of Hydrogen and Arsenic.

Mr. Vaughan Hughes read a short paper on the subject, in which he said that the great annoyance caused by blisters had led to the abandonment of steel for many useful purposes. He doubted whether the difference given in sulphur and phosphorous contents were the cause of the blisters. He rather thought that the excesses of those contents were evidences of badly made metal. Another important point was as to whether cognizance had been taken of the presence of arsenic. Hydrogen might be an important factor in producing brittleness where it was absorbed or occluded. There was ample evidence that nascent hydrogen would pass through ordinary sheet steel at 150 degrees C, or if the metal were in the neighborhood of what is popularly known as red heat—whether by a process of diffusion or solution. Oxide porosities might be formed, which would be attacked by the acid liquor in preference to the metal, and which soon burrowed its way into the surface before the normal surface or ferric oxide was entirely removed, and internal oxides would form cavities. In testing he had found a great number of such cavities filled entirely with pickle.

Mr. Stead said he accepted Mr. Law's facts, but it was a question whether the oxide of iron might not have two forms; namely, both in the absorbed and in the free state. Most investigators were agreed there was oxide absorbed which could not be seen by a miscroscope. He would suggest that beside the microscope they should apply analytical methods for the determination of oxide in steel. He said also that hydrogen would go through the particles very much more readily when the steel was heated to a high temperature, and they must proceed to examine for hydrogen and nitrogen and a new element they did not know of. There was a great work to be done in this direction.

Prof. Turner said that the true line of research lay in producing blisters at will, but he had not succeeded in doing so. Until they took out the gas and proved what the blisters contained, they had not solved the problem. He did not think that the author had proved his theory. Mr. Law replied that he would welcome Mr. Stead's researches. He would candidly admit that his theory was not proved. He was waiting for someone to prove it.

It was agreed to consider the other papers as read, and the conference concluded with thanks to the Institution of Civil Engineers and to the president for his able conduct in the chair. The president in acknowledging the compliment made a final appeal for a large attendance at the July meeting. He said that they were hoping for a record gathering and he especially desired that they would come and welcome their American friends. They had an excellent list of papers, ten being promised already, and no doubt, others would be added. They hoped to do some important business and they had been granted the use of the Guild hall, for which they were greatly obliged to the Lord Mayor. The Prime Minister had also consented to attend. Whatever their politics, they must all take this as a great compliment. This concluded the proceedings and the meeting then adjourned.

CALCIUM STEEL.

Consul-General Mason, Paris, in a recent consular report, furnishes further information regarding calcium steel. The product known as calcium steel is earthen ware of great hardness and durability. It appears now that efforts are being made in Germany to produce a new form of steel by combining it with a certain proportion of metallic calcium, as is done with nickel and chromium in the manufacture of nickel and chrome steel. Experiments are now in progress at the works of the Electrotechnical Co., in Bitterfield, Prussian-Saxony, to prove or disprove the theory that calcium combined with molten iron in the process of steel manufacture might add highly desirable qualities to the ultimate product. The company has found the means of producing calcium metal from certain minerals in quantities and at a cost which permits it to be freely used for industrial purposes. With the calcium thus provided, a series of experiments is being made, but nothing conclusive as yet can be definitely ascertained. The German technical press does not think that the results thus far are entirely reassuring. *Metallurgie* states "through these experiments it is proven that calcium metal is not combined with iron in a molten condition, and its use for the formation of alloys with iron is therefore impracticable." In the same publication, L. Stockern gives the conclusion of researches which he describes as follows: "From the foregoing facts, the conclusion follows that calcium steel can scarcely be considered as applicable to the production of steel from pig iron. On the other hand, it may be useful in refining copper in bronze casting and will not unlikely replace the hitherto more costly magnesium metal in the refining of nickel."

COMPRESSION OF STEEL INGOTS IN THE MOLD.[1]

BY A. J. CAPRON.

The subject of the fluid compression of steel has recently assumed such prominence that but little introduction is necessary. Its use up to the present has been chiefly confined to the higher qualities of steel and the largest sizes of ingots, but the system to be described is relatively very cheap, both in first cost and in working, and moreover a single press can deal equally

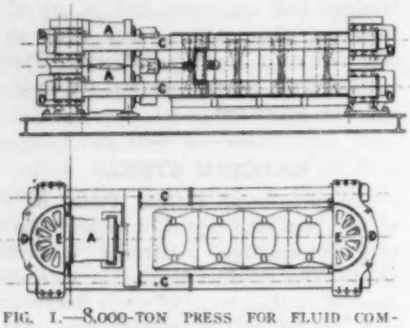


FIG. 1.—8,000-TON PRESS FOR FLUID COMPRESSION OF STEEL.

well with a few ingots of moderate size or with a large number of smaller ingots, making the process applicable on a much more commercial and wider scale. The process consists in utilizing special forms of ingot molds, so constructed that pressure can be applied to the ingots in a horizontal press. The ingot molds are preferably placed in series, so as to reduce the power of the press required. It should be mentioned that both the various forms of molds used and also the press are the subjects of patents which have been taken out by Messrs. Robinson and Rodger, of Sheffield, and constitute improvements on the American and English patents of Mr. John Illingworth, of New York. On this system a horizontal press was used, and means were provided for opening the molds after the casting of the ingots. These ingots were of small size, say about 80 pounds, and the method of pressing was to insert a plate or wedge between the opened mold and the still hot ingot. Upon the pressure being applied the mold was closed, and the ingot compressed to the extent of the thickness of the inserted plate. This mode of procedure was found to be inapplicable to ingots of any considerable weight, and the methods about to be described were devised and used up to the present with unvarying success. Mr. Illingworth is interested with Messrs. Robinson and Rodger in these new developments.

[1] A paper presented at the London (May 1906) meeting of the Iron & Steel Institute.

The construction of the ingot molds and of the press is illustrated in Figs. 1 and 2. It will be seen that the ingot molds are placed inside the press, the steel being run into the molds in this position, so that they have not to be transported with the liquid steel in them, and the press practically forms the casting pit. The ingot molds are open at the bottom, and may each have a separate loose bottom plate, or may stand upon one common plate for bottom running.

In Fig. 1 the ingot molds are divided in the center, there being a loose packing piece of any convenient form and size on each side between the halves of the mold, or the entire sides of the molds may be made removable according to the purpose for which the ingots are intended. The steel is cast into all the molds simultaneously, either by means of a trough with a separate runner for each mold, or in groups by means of bottom running. Within a few minutes of the casting the ingots solidify on their surfaces, and shrink away from the molds, so that the packing pieces can be withdrawn with perfect safety, and the pressing can be commenced, just sufficient pressure being applied to follow up the contraction that is taking place. The pressure is continued, and gradually increased during solidification, until a final pressure of about two tons per square inch on the surface is reached, and this pressure is maintained for a short time, insuring absolute solidity throughout the ingot.

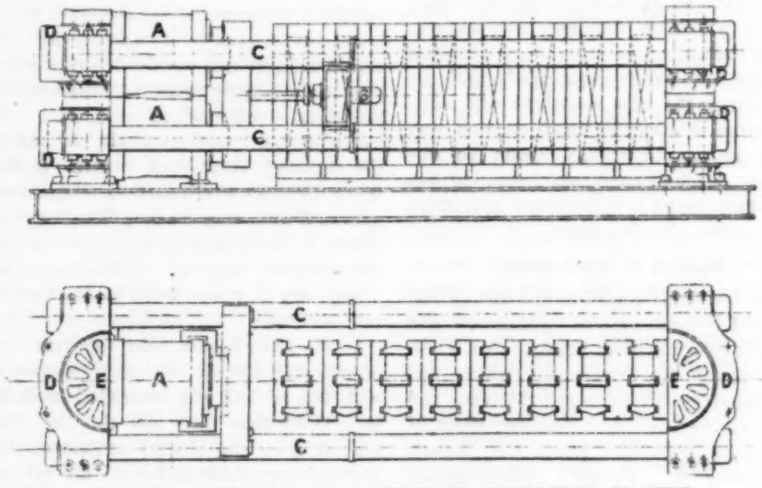


FIG. 2.—5,000-TON HYDRAULIC PRESS FOR FLUID COMPRESSION OF STEEL.

Another construction of ingot mold is shown in Fig. 2. The sides are held in place by grooves in the cross plates, which are made deep enough to allow for the requisite compression. The press holds the molds in place during casting, and there being no packing pieces to remove, can at once follow up the contraction until the maximum pressure is reached.

The construction of the press which is adopted in this system is illustrated in Figs. 1 and 2. Fig. 1 illustrated press of 8,000 tons, and Fig. 2 of 5,000 tons. The various parts are as follows: AA pressing cylinders, BB pushback cylinders, CC tension bars, DD steel straps (in tension), EE cast iron packing blocks (in compression). The length of the ingot molds being generally greater than their width, it is convenient to have two pressing cylinders, as shown, one above the other, so as to distribute the pressure better on the molds. This halves the size of the pressing cylinders, and reduces the weight of the parts. The cylinders abut on the semi-circular packing blocks and the strain is transmitted to the columns through the steel straps. These straps may be made in halves, as shown, in which case no nuts are required on the columns, but only plain solid collars. This construction of press has also been patented, the advantages being simplicity and cheapness compared with the usual design of press. It is also an extremely convenient form of press for erection, and the weight of the various component parts is extremely moderate, even for presses of very great power. The rams are made hollow and fitted with spherical-ended thrust-rods, so as to avoid all uneven strains that might otherwise be caused by any unequal yielding of the ingots.

The press is worked by direct high pressure pumps at about three tons per square inch. The gradual increase of pressure required is regulated by a by-pass valve, the regulation being an extremely easy matter, and the power required being very small, 30 horsepower being sufficient for an 8,000-

ton press dealing with a cast of 60 tons of steel.

This process is already quite beyond the experimental stage, as it has been in constant daily use in Messrs. Jessop's works in Sheffield for over two years in the manufacture of their highest qualities of crucible steel.

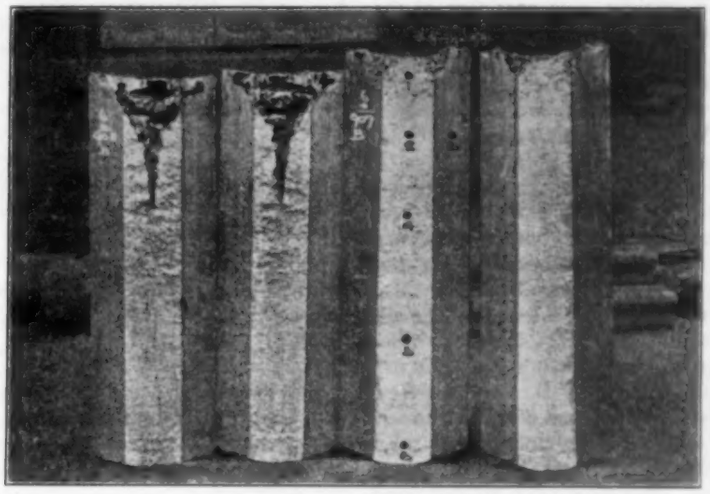


FIG. 3.—SECTIONS OF COMPRESSED AND NON-COMPRESSED INGOTS.

The press they use is of 1,100 tons power, and the sizes of ingots made at a cast, and the time occupied in compressing, are as follows:

One ingot of 34 cwt..... 45 minutes
Two ingots of 17 cwt.,
placed tandem ..... 35 minutes
or, six ingots of 8½ cwt.,
ranged two abreast .... 25 minutes

Up to the present, upwards of 1,500 ingots have been dealt with in this press, and not a single failure has been experienced. Fig. 3 is a photograph of sections of a compressed and a non-compressed ingot, each of 17 cwt., and of the same quality of steel, having been cast simultaneously from the same ladle. The compressed ingot is entirely free from pipe, and sound right up to the top, but besides this it will be seen from the fracture that the texture is far finer, indicating the work that has been put on the steel by the compression.

It is the practice at Messrs. Jessop's works in the case of the larger sizes of ingots to keep the top open during the process of compression. This is done by laying a fire clay ring on the top of the ingot and using a feed rod. Directly the compression commences, just sufficient pressure is applied to cause the liquid metal to rise up into this ring. The level of the liquid metal is watched by the man who controls the pressure, and it indicates exactly the increase of pressure required to take up the contraction due to cooling. Towards the end of the process the last portion of the liquated metal is squeezed out and rejected. Analysis shows that this contains about 0.05 per cent of sulphur, or about four times the average percentage in the ingot, and consequently a substantial improvement in quality is effected by this means, which is very valuable, especially in high-class steels. An ordinary pressure gauge indicates when the full pressure has been reached.

The following analysis taken from a compressed ingot, Fig. 3, shows a remarkable uniformity of composition and absence of segregation:

	Sulphur	Phosphorus
	Per Cent	Per Cent
Drillings from hole No. 1	0.011	0.009
" " " " 2	0.019	0.013
" " " " 3	0.019	0.009
" " " " 4	0.016	0.011
" " " " 5	0.016	0.009
" " " " 6	0.014	0.009
Liquated portion squeezed out	0.052	0.027

Other analyses given in the appendix show equal uniformity of composition, and this was the invariable experience.

The best proof of the success of this process is the fact that the waste amounts to barely five per cent, that is to say, practically the whole of the ingot is used, and stands without any instances of failure the very severe tests of finishing and hardening to which crucible steel is subjected in making milling cutter and other similar tools.

With open-hearth steel equally satisfactory results have been obtained, and Messrs. Jessop are now putting down a 7,200-ton press for this class of steel, and for dealing with larger ingots up to 20 tons in weight.

To summarize, the advantages obtained by the use of this system are briefly as follows:

1. An absolutely sound ingot is insured free from any pipe or cavity, so that the whole of the ingot can be used, and practically no waste incurred.

2. Being able to watch the top of the ingot and get rid of the liquated portions, a great improvement in the quality of the steel can be obtained.

3. The ingots are cast in place, and have not to be moved until the completion of the compression.

4. The simplicity and cheapness of the plant, and the ease with which it can be worked by unskilled labor.

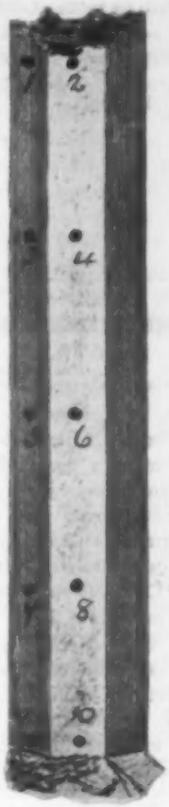


FIG. 4.—DRILLINGS ON COMPRESSED INGOT.

5. Owing to the way the molds are divided, the ingots are made parallel, which is some facility in rolling.

The process is, of course, specially suitable for cases in which a superior quality of steel and severe tests are required, as, for instance, for tires, axles, billets for wire-drawing, and all other purposes in which the absolute soundness of the steel and freedom from blow holes and all defects is of great importance. Besides this, advantage may be taken of the fact that the compressed ingot is at least equal to steel that has been forged or cogged, and consequently the cost of the sub-

sequent processes of manufacture may in many cases be greatly reduced by the adoption of this system.

APPENDIX

Analysis of Drilling 6/100 C.

No.	Sulphur	Phosphorus
	Per Cent	Per Cent
1	0.022	0.012
2	0.024	0.015
3	0.019	0.013
4	0.019	0.011
5	0.016	0 013
6	0.016	0.009
7	0.016	0.012
8	0.014	0.009
9	0.014	0 010
10	0.011	0.011

Analysis for Drilling 6/102 C.

No.	Sulphur	Phosphorus
	Per Cent	Per Cent
1	0.014	0.014
2	0.036	0.024
3	0.016	0.011
4	0.016	0.013
5	0 014	0.010
6	0 011	0.008
7	0.014	0.010
8	0.011	0.008
9	0 011	0 012
10	0.011	0.011

BOILERMAKERS AMALGAMATE.

(Special Correspondence.)

Milwaukee, Wis., May 22.—The International Railway Master Boilermakers' Association, after a long discussion at the annual convention just closed here, decided to amalgamate with the Master Steam Boilermakers' Association. Richmond, Va., was selected for the next convention. C. L. Hempel, Omaha, Neb., was elected president; E. J. Hennessey, Depew, N. Y., vice president; A. M. Lucas, Milwaukee, second vice president; E. P. Kavanaugh, Baltimore, third vice president; T. J. Smallwood, Frankfort, Ind., fourth vice president; J. T. Goodwin, Richmond, Va., secretary and treasurer.

The Chicago, Milwaukee and St. Paul Ry. has finished in thirty days a car-erecting shop 200 x 600 feet in size, in which it will make 2,000 or more box cars a year. A concrete blacksmith shop 80 x 200 feet in size and an addition to the foundry, in which the output of car wheels will be increased from 200 to 600 a day, are now in progress. Milwaukee is to be headquarters for shop work made necessary by the extension of the system to the Pacific coast.

The Falls Rivet & Machine Co., Cuyahoga Falls, O., has purchased the property formerly occupied by the Kearney & Foote File Co., Kent, O., and is equipping this plant with machinery for making rivets and bolts. It expects to be in position to turn out this class of material in about 60 days. The main offices will remain at Cuyahoga Falls.

FEW CHANGES

Made in the Wage Scale by the Amalgamated Association Convention.

The annual convention of the Amalgamated Association of Iron, Steel & Tin Workers, at Cincinnati, made comparatively few changes in its wage scales, and, with the single exception of J. F. Wright, vice president of the eastern division, who is succeeded by James B. Mincher, of New Haven, Conn., all the old officers were re-elected, as follows: P. J. McArdle, president; John Williams, secretary-treasurer; M. F. Tigue, assistant secretary; Ben I. Davis, editor and manager of the Amalgamated Journal; Jos. A. Bowers, insurance secretary; vice presidents, Thos. Williams, Pittsburg, boiling division; Ben F. Jones, Allegheny, Pa., finishing division; Llewellyn Lewis, Martin's Ferry, O., sheet division; Walter Larkins, Martin's Ferry, O., tin division, and James B. Mincher, New Haven, Conn., eastern division. Conference committees appointed to meet with the manufacturers on wage scales adopted, were appointed by President McArdle as follows:

Boiling division:—Thos. Williams, Pittsburg; D. D. Dixon, East Chicago; W. E. Eagan, E. St. Louis; Joseph Grandidier, New Albany; Wm. Hornberger, Fort Wayne; Wm. Lamb, Youngstown; Thos. X. Fitzgerald, Terre Haute; Chas. J. Monahan, Pittsburg; Andrew McCready, St. Louis.

Finishing division:—Ben F. Jones, Pittsburg; D. J. Evans, East St. Louis; Jas. W. Fielding, Cleveland; Elias Jenkins, Youngstown; John Price, Youngstown; Samuel Williams, Youngstown; Frank Williams, East Chicago; D. U. Williams, Birmingham, Ala.; John D. Jones, East Chicago; W. S. Dragoo, Terre Haute; Jos. W. Rutledge, New Albany.

Sheet Division:—Llewellyn Lewis, Martin's Ferry; Andrew Black, Struthers, O.; Fred Wilson, Cambridge, O.; Wm. Hilton, Martin's Ferry; Chas. R. Hughes, Middletown, O.; Harry Allington, Newport; John G. Hagan, Piqua, O.; R. T. Lynch, Martin's Ferry; Leo. Smith, Martin's Ferry.

Finishing Division:—Walter Larkins, Martin's Ferry, O.; David J. Davis, New Castle; John Griffith, Washington, Pa.; Harry Griffith, Steubenville, O.; D. J. Jenkins, Sharon, Pa.; Jenkin Jones, Follansbee, W. Va.; J. W. Thompson, Granite City, Ill.; A. N. Whistler, Canton, O.; William McDonald, Ellwood City, Ind.; Mathew Richards, New Castle, Pa.

The new scales, which, with one or two exceptions are practical readoptions of the 1905-6 scales, the only notable change being that in the boiling division the card rate is changed on 1.2c card rate from $5 to $5.25 with the remainder of the card to raise on a 25c basis.

The new scales which the manufacturers will be asked to accept are indicated in the following summary of additions and changed.

BOILING SCALE.

1	c	Bar Iron	$5.00
1	1-10c	Bar Iron	5.00
1	2-10c	Bar Iron	5.25
1	3-10c	Bar Iron	5.50
1	4-10c	Bar Iron	5.75
1	5-10c	Bar Iron	6.00
1	6-10c	Bar Iron	6.25
1	7-10c	Bar Iron	6.50
1	8-10c	Bar Iron	6.75
1	9-10c	Bar Iron	7.00
2	c	Bar Iron	7.25

FOOT NOTES.

Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31 and 32 unchanged.

NEW FOOT NOTES.

New No. 33—When a heat of swarth, or a heat of half swarth and half turnings, cannot be rolled in the furnace by reason of brass or other metals in the heat, and it becomes necessary to pull the heat out, sixty (60) per cent of the charge shall be paid for.

New No. 34—That the company put water shields on all furnaces in puddle mills.

New No. 35—That the company shall furnish tap buggies for the puddler.

New No. 36—That all standing turn men get their money from the office of the company.

MUCK OR PUDDLE MILL SCALE.

The muck or puddle mill scale was adopted as per scale of 1905—6 with the exception of two new foot-notes which are as follows:

8.—On muck or puddle mills in which three (3) crews are employed, three (3) rollers shall also be employed.

9.—That company shall furnish laborers to work crane when changing rolls.

BUSHELING ON SAND BOTTOM SCALE.

On recommendation of the committee the base prices of scale of 1905—6 was adopted.

NEW FOOT NOTES.

Foot notes Nos. 1, 2, 3, 4, 5 and 6 were adopted without change. Foot Note No. 7 was revised by striking out all after the word paid.

No. 8 was revised by striking out all after the word busheling.

Nos. 9, 10, 11, 12, 13 and 14 were adopted without change.

PILES ON BOARD SCALE.

No change was made in the 1905-6 scale.

The following foot note was added as No. 4 to the Piles on Boards Scale: "In case of breakdowns in busheling

mills forty-five minutes shall be the time to wait for the same to be repaired; and when balls must be thrown out, the company shall bloom same if possible, and if bloomed the company shall pay for the same."

KNOBBLING SCALE.

The committee recommended that no changes be made.

HEATING SLABS AND SHINGLING SCALE.

The wage committee recommended that no change be made in the base or foot notes.

BAR MILL AND 12-INCH MILLS SCALE.

The wage committee recommended that no change be made from the 1905-6 scale in the base of the bar and 12-inch mills scale and this was concurred in by the convention.

FOOT NOTES OF 12-INCH MILLS SCALE.

Foot notes 1, 2 ,3, 4, 5, 6, 7 remain unchanged. No. 8 was referred to conference. Nos. 9, 10 and 11 unchanged. No. 12 was changed to read:

"The company shall pay fireman on coal heating furnaces, stockers included, except where the production of solid body of steel is fifty (50%) per cent or more in any pay period; then the company shall pay one-half, except where the practice requires the full payment.

Nos. 13, 14, 15 remain unchanged.

NEW FOOT NOTE BAR AND 12-INCH SCALE.

New No. 16—That catcher's helper receive not less than one-third (1-3) of catcher's wages.

This not to be used to reduce helpers receiving higher wages.

Resolutions Nos. 2, 10, 13, 14, 15, 18 and 19 in the program of business under the bar and 12-inch mills scale were referred to a special committee consisting of bar mill delegates.

BAR AND 12-INCH SKELP SCALE.

The wage committee recommended that no change be made in prices for mills making a specialty of working pipe or skelp from the iron and steel scale of 1905-6.

PLATE AND TANK MILL SCALE.

No changes were made from the plate and tank mill scale of 1905-6.

GUIDE, 10-INCH, HOOP AND COTTON TIE MILL SCALE.

The wage committee recommended that no change be made in the base prices of the guide, 10-inch, hoop and cotton tie mills scale, except that a new column for stranders be placed in the base schedule of prices, to be taken from the rollers' column, thus doing away with foot note No. 21 in above scale.

That the following be added to the base prices under the hoop and cotton tie schedule:

"2¼ and 2½ channel rub-iron and 2½ wagon-rub, 2.42 total."

The following new foot note, to be known as No. 3 of the hoop and cotton tie mills:

"On all sizes of pole caps 13 gauge and lighter, ten (10%) per cent above band iron prices shall be paid."

FOOT NOTES—GUIDE MILLS, ETC.

Foot notes 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20 remain unchanged. No. 21 eliminated.

NEW FOOT NOTES—GUIDE MILL, ETC.

New No. 22 —That in mills where one crew works on two separate mills, the crew will not be required to change rolls on one mill while working on the other.

JOBBING AND PLATE MILL SCALE.

Committee recommends that the following be placed in the scales for plate mills:

	8 & heavier	9 & 10	11	12
Roller	.275	.325	.413	.45
Heater	.206	.243	.308	.338
Shearman	.308	.364	.462	.494
Spannerman	.109	.131	.165	.176
Finisher	.103	.121	.156	.172
Rougher	.114	.135	.171	.182
Second Rougher	.103	.121	.156	.172
Catcher	.103	.121	.156	.172
Second Catcher	.079	.095	.119	.135
Screw-down	.063	.074	.094	.108
Paddle-boy	.052	.06	.077	.09
Run-down	.052	.06	.077	.09
Heater's Helper	.088	.104	.131	.147
Second Helper	.08	.09	.115	.13

1. For No. 13 gauge, and all lighter gauges, straight jobbing mill prices shall be paid.

2. All iron and steel rolled on plate mills, sheared to patterns of irregular shapes or circles, shall be paid for at the weight of the square sheet. This clause shall not apply to boiler and tank heads, or any plates or sheets where the waste does not exceed ten per cent, above square sheets, but where the waste does exceed ten per cent above square sheets the company agrees to pay 20 per cent extra above scale prices.

3. The foot note that applies to roller's scale shall apply to the hands' scale also.

4. That on all plate mills where coal is used, the company shall pay for firing the pair or slabbing furnace.

Committee recommends that the following be placed in the scale for jobbing mills:

8 and heavier	83 17
9 and 10	3 53
12 to 14	4 23
15 to 17	4 90
18 to 21	5 96
22	7 78
8 and heavier	2 65
9 and 10	3 08
11	3 53

This to apply to jobbing mills rolling 18 and heavier, over 48 inches wide.

1. That on all jobbing mills where coal is used, the company shall pay for firing pair or slabbing furnace.

2. That the rougher, pair-heater and matchers be paid ten per cent above scale prices on jobbing mills where slabs must be dragged to the rolls, and no telegraph is used.

TIN PLATE SCALE.

The wage committee recommended and the convention concurred in that the preamble and base prices in the tin scale remain the same as in the 1905-6 scale.

FOOT NOTES—TIN SCALE.

Foot notes Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 and 21 remain unchanged. No. 22 was changed to read:

"When working packs over eighty (80) inches long and weighing more than sixty (60) pounds, help shall be furnished catcher."

No. 23 remains unchanged.

NEW FOOT NOTES—TIN SCALE.

New No. 24 —That the "screw boys" shall not handle scrap.

SHEET AND TIN BAR SCALE.

The only change from the 1905-6 scale is that the convention adopted a provision that when sheets are rolled one-half gauge lighter than the gauge they represent the next lighter gauge shall be taken for the rolling price.

EASTERN SCALE.

As the association did not succeed in having its eastern scale adopted, it was allowed to stand as approved by the convention last year.

The Empire Iron & Steel Co.—The Empire Iron & Steel Co., Niles, O., has recently been reorganized, and the new management proposes to enlarge and improve the plant, which now has a capacity of 20,000 tons per year of sheets. The products manufactured are black sheets, galvanized sheets and all forms of corrugated and other roofing material. There is also a metal lath department. The new company proposes to make a specialty of the manufacture of sheets for electrical purposes and highly polished sheets of the very best grades. The president of the new organization is J. Warner, who for several years was manager of the following mills of the American Sheet Steel Co., with headquarters in New York: Two mills at Scottdale, Pa.; Aetna Standard Works, Bridgeport, Ohio; Cambridge Works, Cambridge, Ohio; Struthers Works, Struthers, Ohio; Piqua Works, Piqua, Ohio; Dennison Works, Dennison, Ohio; Muncie Works, Muncie, Ind.; Dresden Works, Dresden, Ohio; Canal Dover Works, Canal Dover, Ohio; New Philadelphia Works, New Philadelphia, Ohio; Canton Works, Canton, Ohio. The superintendent of the works is W. T. Hardesty, formerly district manager of the American Sheet Steel Co.

RAILWAY EQUIPMENT

And Construction Provide Heavy Demand for Canadian Steel Products.

(Special Correspondence.)

Toronto, Can., May 21.—The leading feature of the situation in the Canadian iron and steel trade continues to be the heavy demand for railroad construction and equipment purposes, including steel rails, structural steel for bridges, and rolling stock. The orders of the Canadian Northern for rolling stock amount to a total of $2,975,000, including forty-four powerful engines. This is all being made in Canada, with the exception of contracts to the extent of $275,000, which have gone to American manufacturers. Delivery of some of the locomotives and cars is now being made.

About 20,000 tons of the 50,000 ton order for steel rails placed by the Grand Trunk Pacific with the United States Steel Corporation, has been delivered at Fort William. The Grand Trunk Pacific did not receive permission of the government to bring in these rails duty free, and the question of whether they will be allowed to escape the payment of duty will probably come up in Parliament. There is much discussion as to why the order went to the United States, as the contract of the company binds it to purchase supplies in Canada, as far as possible, and despite statements formerly made to the contrary, it is now stated that the Dominion Iron & Steel Co. was in a position to fill the order.

Since the opening of navigation the mills at Sault Ste. Marie have delivered 4,000 tons of steel rails to the Canadian Pacific railway for its Toronto-Sudbury branch and the Guelph to Goderich extension. The extension northward of the Temiskaming & Northern Ontario Railway, and the completion of the section of the James Bay line immediately north of Toronto, in each of which many steel bridges are required, call for large quantities of structural steel work. One of the bridges on the former line requires 550 tons of steel.

The Grand Trunk railway is sending 50,000 tons of partially worn steel rails to the United States, where the worn ends will be sawed off and the rails re-shipped. An arrangement has been effected with the government, by which it will not collect duty on the value of the rails when returned to Canada, but only on the value of the work done in the United States.

The Imperial Steel & Wire Co., of Collingwood, has sent to Winnipeg houses a cargo of 30,000 kegs of nails, which is the largest consignment of the kind ever unloaded at Fort William, requiring 127 cars to take it from the point of transshipment to its destination.

Dr. A. P. Coleman, professor of geology, has gone to the region lying east of Lake Nepigon, in the Thunder Bay district, to make a thorough exploration of the known iron ranges in that locality, for the Ontario Bureau of Mines.

The following companies have been incorporated.:

General Supply Co., of Canada, Ltd., head office Ottawa, capital $20,000, to manufacture machinery appliances, etc. Incorporators John W. Smith, Godfrey B. Greene Jr., Francis H. Crysler, Norman G. Larmouth, and Charles J. R. Bethune. Jenkins Bros., Ltd., head office Montreal, capital $209,000 to manufacture machinery, etc. Incorporators Alfred B. Jenkins, Frank G. Swain, A. E. Brady, Henry D. Gordon and W. R. Stewart.

Findlay Bros. Co., Ltd., head office Carleton Place, Ont., capital $200,000 to manufacture stoves, ranges, etc., provisional directors, David Findlay, Wm. Findlay and John K. Findlay.

DOCKS FOR NEW STEEL PLANT.

A joint resolution recently passed by the house of representatives authorizes the United States Steel Corporation to build out into the water of Lake Michigan, off the site of the new steel mills in Indiana, to a depth not exceeding 25 feet. Wharves, piers and other structures with intervening slips will be erected, subject to legislative consent from the state of Indiana and approval of the plant by the war department. In its report recommending the passage of the joint resolution, the committee on rivers and harbors said:

"The United States Steel Corporation owns a large tract of land upon which it contemplates building a very extensive iron and steel plant. Its plans, as already outlined, involve the expenditure of upward of $50,000,000. It is also thought that many other industries will locate in the immediate vicinity. It is expected that these great works and the accompanying minor industries and activities will employ upward of 15,000 men and necessitate the building of a city of 75,000 population. The construction of piers, wharves, docks and slips out to a depth of twenty-five feet of water will provide facilities suitable for the largest boats on the great lakes."

CONGRESS WARNED

That the Pending Anti-Injunction Bills are Dangerous.

The following vigorous letter written by Mr. W. B. Cowles, vice president and treasurer of the "Long Arm" System Co., Cleveland, against the anti-injunction bills is self explanatory:

Cleveland, May 15, 1906.

Hon. John J. Jenkins,
Chairman, House Committee on the Judiciary, House of Representatives, Washington, D. C.

Dear Sir:

If it is in order for a layman and a manufacturer to present a brief argument in a matter of law-making to a lawyer, allow me to respectfully submit the following:

1. Some centuries ago your ancestors and mine were fighting barbarians and had the undoubted and inalienable right to protect themselves and their property against other barbarian violators.

Our ancestors transmitted this right to us and each now possesses it absolutely unimpaired, except that civilization has induced us to acquiesce in the delegation of its militant use to the officers and machinery of the law with the stipulation that it shall be exercized for us when we need it.

In other words, you and I, as civilized and "law abiding" citizens, have had a contract made for us with the law whereby the latter is bound to exercise for us our own inalienable right of self defense and protect us and our property from barbarous injury. All this is fundamental, axiomatic, and no sophistry or act of yours or mine can blot it out in the least.

2. The law in carrying out its contract with us as civilized citizens provides judges (persons set apart from passion, with experience, cool heads and trained minds to see the truth and weigh out justice); to these we may appeal, often in time to prevent, by means of an injunction, threatened barbarism against our lives and property. In other words, we notify the law to exercise for us our own inalienable right of self-protection and so prevent barbarism. This is the plain duty of the law and if it is not carried out the contract instantly becomes void and we are forced to revert again to militant barbarism ourselves—or die the death of cowards and have our property destroyed or carried off, all precisely as in the Stone Age. This, also, is fundamental, axiomatic, and no socialist or labor agitator on earth can successfully change it.

3. But now come certain of our fellow citizens, equal parties with us to the said contract with the law, and say

to the rest of us:—"This blood bought contract of centuries must be changed: we object to being equal parties with you in this contract: we are a special class and we must have the special privilege of going back to barbaric violence when we feel like it and the law must not prevent us; though, of course, if the law can catch us and prove the barbarism on us afterward, we suppose it will have to take its course, though we call even that an outrage to our special class!"

4. Moreover, it can be noted that this special class which now demands the special privilege of reverting to barbarism when it feels like it, is just the class of our composite society which has no property open to mob violence; while the merchant, the manufacturer, the building contractor, and all those who have such property, are still supposed to be hand-tied by their contract wtih the law! The insufferable inpudence of this demand from the special class can only be appreciated by comparing the position of this class with its prototypes of the Stone Age. The barbarian of that age at least had the picturesque merit of bravery: when he went out to kill, burn and destroy he took his life in his hands, knowing that he could meet the man with property armed and ready and that the latter would "fight for all he was worth." These barbarians of our own day wish opportunity under the law to do their worst while the ordinary citizen with property is bound helpless.

5. Perhaps the unspeakable cowardice of the Gomperites can best be illustrated by bringing the anti-injunction down to an absolutely fair and square deal between the two parties involved: the special class which demands that the preventive restraint of the injunction be removed for it only, and the otlier special classes whose property is thereby thrown open to the mob:—

Suppose you amend the anti-injunction bills so that Gompers and his vicious followers can run their riots without injunction, then at the same time specifically authorize every merchant, manufacturer and builder in the country to equip his property with Gatling guns and Winchesters with full license to use them *ad. lib.* in case of riot and mob violence endangering said property; each case of course, to be fairly tried before the courts after all the damage is done to both "Kilkenny cats."

But after you have so amended these bills and before reporting them to the House, I respectfully suggest that you pause and hear the Gomperian whines and threats (yes, he has the cheek) and protestations about such a square dealing amendment being "another outrage on labor!" (Leave it to Gompers to make the once decent and deserving name of labor smell to heaven!)

6. What can be said for the civilization of these fellow citizens who cry out against the law and its machinery the injunction: who would void the contract between us and the law and so force all "peace loving" citizens to reclaim and use again for themselves their now delegated right of self-defense?

What can be said of a mind and a judgment which can countenance such a montrous proposition?

What can be said of the misguided citizen who could really think such a proposition a safe one, even to juggle with?

My dear sir, there is dynamite in these anti-injunction bills:—Please handle with care!

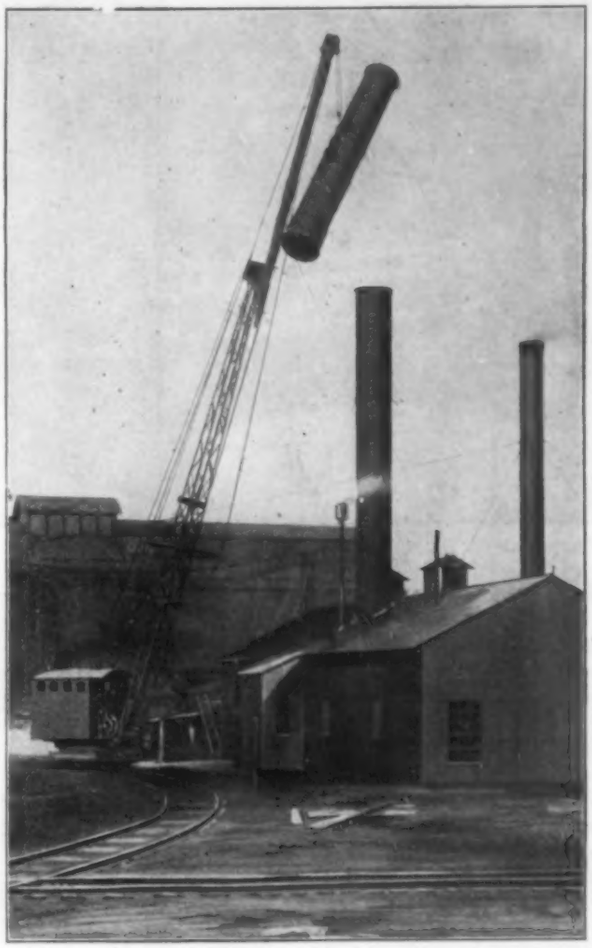
Very respectfully,

W. B. Cowles.

Iron bolts in the Thames bridges in London exposed to the atmosphere were corroded in 25 years from ⅞-inch diameter to ½-inch.

A NOVEL USE OF A LOCOMOTIVE CRANE.

The accompanying illustration shows a novel use of a locomotive crane by the Browning Engineering Co., Cleveland, namely, that of placing a section of smoke stack. The work was done at the shops of the Browning Engineering Co., Collinwood, Ohio. The crane used is one of the Browning Engineering Co.'s No. 2 size, and the section of smoke stack weighs four and one half tons. The total height of the stack when complete is 100 feet. The crane worked at a radius of 25 feet. The boom on the crane was 65 feet, which was lengthened for the occasion by splicing a heavy 40-foot timber to the boom. Ten feet were allowed for lap, making the total length of the boom 100 feet. This shows one of the many possibilities of a locomotive crane for handling heavy material.



ERECTING A SMOKESTACK WITH A LOCOMOTIVE CRANE.

The Colorado Fuel & Iron Co. has opened offices in room 232, Bacon Bldg., 12th and Washington streets, Oakland, Cal. Orders for the San Francisco district will be given preference.

LARGE PERFORATING PRESS WITH AUTOMATIC ROLL FEED.

In the accompanying illustration is shown a large automatic gang punching press built by the E. W. Bliss Co., 8 Adams street, Brooklyn, New York. A striking feature of this press is its size, it being possibly the largest of this type ever built. The slide measures 10 feet between housings.

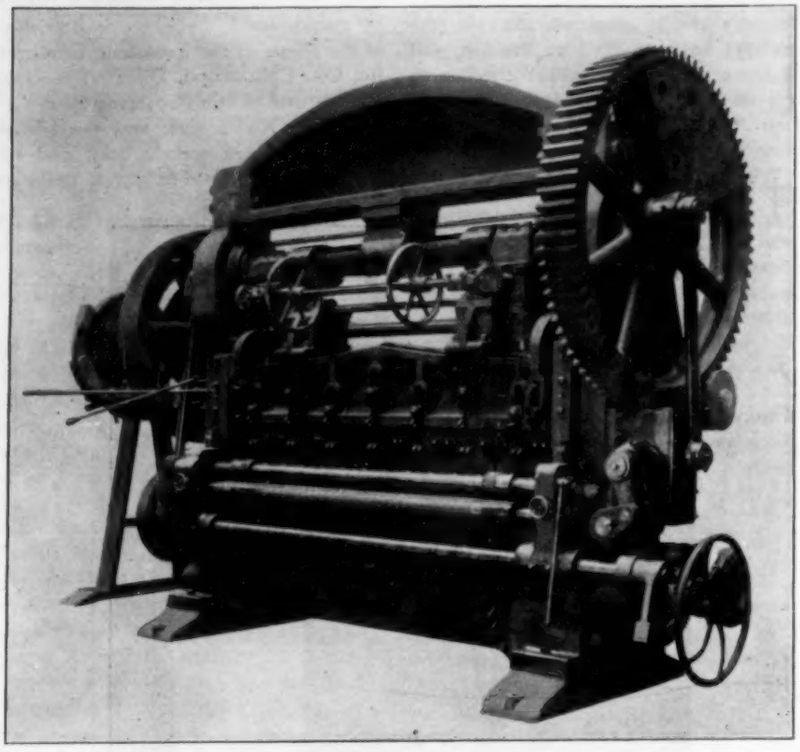


FIG. 1.—BLISS PERFORATING PRESS.

Although the holes punched by this machine usually are not large, a great number of them throw a heavy strain on the frame, and this fact has been borne in mind in the design. The slides hook to the ends of the crosshead and similarly hook into the beds. From this it will be seen that the bolts alone are not depended on. This feature is clearly shown in the illustrations. The main shaft is of very large diameter and the main gear is counterbalanced to equalize the weight of the slide carrying the punches.

The cam stripper slide is attached to the main slide. The former receives its motion from the cams on the main shaft. The clamping bar and stripper are attached to the stripper slide. The clamping bar is made in small sections, two of which may be seen swung out of the way in Fig. 2. This makes the punches perfectly accessible and facilitates the replacing of any individual punch.

Each slide is separately adjustable. The main slide which carries the punch bar is of easy access. It is set and held by adjustable gibs for taking up the wear. The automatic friction clutch, by which the machine is driven, is arranged to work either by hand or foot. In the present case, the hand lever is used, and by means of it the operator can stop the press at any point of the stroke. Without this feature, it would be almost impossible to set and adjust the punches.

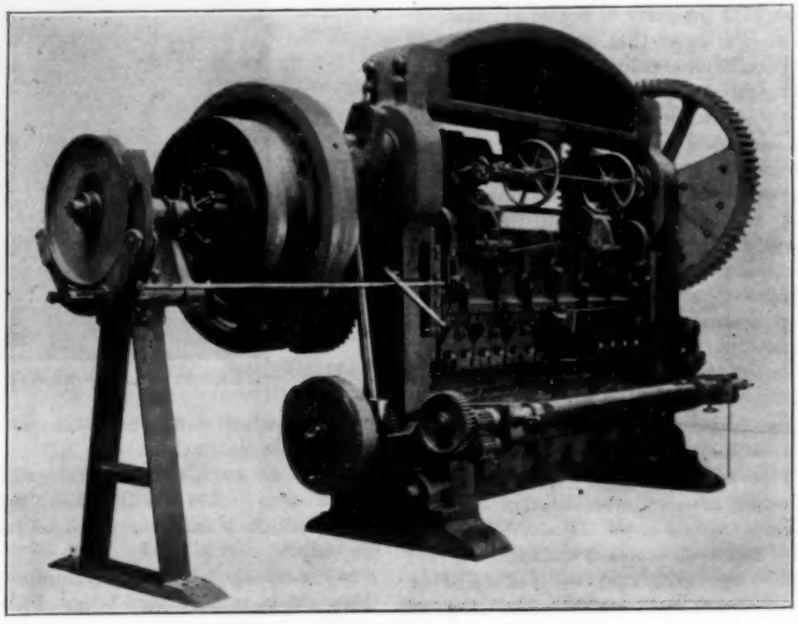


FIG. 2.—PERFORATING PRESS WITH FEED ROLLS DOWN.

Another interesting feature of this machine is the feed rolls. When in position one roll is under the sheet and another above it, with sufficient pressure to insure certainty of movement. The feed is adjustable from zero up to three inches, and sheets of metal up to ¼ inch in thickness may be fed. The feed rolls are shown in the illustration Fig. 2, as swung out of the way for changing dies. Fig. 1 shows them in their working position. The rolls are dropped and replaced easily in a short time. The total weight of the press is 80,000 pounds.

Frisco Will be Supplied:— Frank Baackes, of the American Steel & Wire Co., who is in San Francisco, is thus quoted by the *Chronicle* of that city: "The allied companies in the United States have agreed to give San Francisco the preference in the delivery of all orders. The rest of the country will have to wait. Here is the necessity. We will fill your orders as fast as you can possibly use the material. It will be three months before the debris can be cleared away and plans prepared for new construction. When you are ready for the steel you will get it, and you will have it as fast as you need it for the next three years. It is true that all the rolling mills in the country had been working to their full capacity, but their output is at the call of San Francisco. You will have all you want. As an instance of what we propose to do, I will say that a San Francisco order for steel rails which we had to refuse recently because, in the regular order, we could not promise to deliver in October, will now be filled in six weeks.

Prices Stationary in a Quiet Market.

With one exception the financial situation of the past week was featureless, a condition which resulted in moderate dealings with changes for the most part insignificant. The exception was the negotiation by the Pennsylvania company of its $50,000,000 4½ per cent eighteen-months' loan. The price quoted was 99¾ and notes were said to have been oversubscribed within two hours, but banks were offering them below these figures the following day. The fact that the Pennsylvania company was compelled to borrow on practically a five per cent basis, with the best of security, indicated that later corporation borrowers would be forced to pay a relatively high rate and held out no prospect of an easy money market for some time to come. A depressing factor affecting the same interests was the disclosures made by the Interstate Commerce Commission's investigation of the relations existing between the railroads and producers of coal. Through the combination of these developments Pennsylvania stock went to the lowest mark of the year and other securities were correspondingly dull. Only the copper stocks, Union Pacific and Reading were dealt in to any great extent. Transactions of the first few days of the week were moderate, but these were paralyzed by the railway-coal disclosures and Friday and Saturday sales were extremely small. For the week the total was 4,790,000 shares on the New York exchange. United States Steel was practically abandoned and for the week sold only 250,000 shares, other iron, steel and manufacturing securities sharing in the dullness. Declines were general, but almost without exception were slight. The bond market continued the apathy which it has experienced in recent weeks, rendering it probable that contemplated bond issues will be largely postponed, loans for brief periods taking their place until the market can absorb bonds more readily. The difficulties of more than one large interest of late in placing new issues furnish an accurate indication of the present temper of the market.

FINANCIAL NOTES.

The report of the American Car & Fdy. Co. for the fiscal year ending April 30 is soon to be made public. For the first three quarters the earnings were $2,351,160 and the fourth quarter earnings were considerably more than $1,000,000. Orders now booked are said to be unusually heavy and as they call in increasing number for steel cars, costing more than wooden cars, the profits will be proportionately larger.

The Warwick Iron & Steel Co. has declared a quarterly dividend of 2 per cent, payable June 11. This is the first dividend payment since 1901.

During the week the average price of 20 railroad stocks declined from 127.60 to 126.91.

Bond sales for the third week in May are reported at $9,683,275.

San Francisco banks re-opened Wednesday.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quotation May 12	Closing Quo. May 19	Changes	Date of 1906 Ann. Meet.	Par Value	Capital Outstanding	Dividend Basis	Dividend Being Paid	Dividend Date Last Div. Dec.
Allis-Chalmers Co	21⅛	20¾	− ⅜	Sept.	100	19,820,000		.....	.....
Allis-Chalmers preferred	57	55¾	−1¼		100	16,150,000	7 cum	.....	Feb., 1904
American Can	8⅛	7⅞	− ⅛	Apr. 24	100	41,233,300		.....	.....
American Can preferred	65	63	−2		100	41,233,300	7 cum	5 Q.	Apr., 1906
American Car and Foundry	40⅞	41	+ ⅛	June 28	100	30,000,000		.....	May, 1905
AmericanCar and Foundry preferred	102¼	101	−1¼		100	30,000,000	7 n. c.	7 Q.	Jan., 1906
American Locomotive	67⅛	69¼	+2⅛	Oct. 16	100	25,000,000		.....	.....
American Locomotive preferred	114⅜	115	+ ⅝		100	24,100,000	7 cum	7 Q.	Apr. 1906
American Shipbuilding	56½	56	− ½	Oct. 2	100	7,600,000	4	4 Q.	Apr., 1906
American Shipbuilding preferred	104	105	+1		100	7,900,000	7 n. c.	7 Q.	Jan., 1906
American Steel Foundries	11⅛	10⅞	− ⅜	Oct. 3	100	17,700,000		.....	.....
American Steel Foundries preferred	45⅝	44⅛	− ⅞		100	17,700,000	6 cum	.....	Aug., 1905
Barney & Smith	65	65	.....	June 5	100	1,000,000		.....	June, 1894
Barney & Smith preferred	140	140	.....		100	2,500,000	8 cum	8 Q.	Mch., 1906
Bethlehem Steel	27¼	27¾	.....	April 3	100	15,000,000		.....	.....
Bethlehem Steel preferred	87	87⅜	+ ⅜		100	15,000,000	7 n. c.	7 Q.	May, 1906
Bullock Electric preferred	111	111	.....	Oct. 2	100	1,000,000	6	6 Q.	Jan., 1906
Cambria Steel	35	34½	− ½	March 20	50	45,000,000	6	7 Q.	Mar., 1906
Cambria Iron	49⅞	49½	− ⅜		50	8,468,000	4	4 S. A.	Apr., 1906
Colorado Fuel & Iron	51¾	50¾	−1⅛	Oct. 15	100	30,132,000	7	.....	Apr., 1902
Wm. Cramp & Sons Ship & Eng. Bldg. Co.	25	20	−5	May 31	100	6,098,000	5	.....	Nov., 1902
Crucible Steel	14	13⅝	− ⅜	Oct. 17	100	25,000,000		.....	.....
Crucible Steel preferred	80¼	80	− ⅛		100	25,000,000	7 cum	.....	Sept. 1903
Empire Steel	7	5	−2	Feb. 28	100	2,281,400		.....	.....
Empire Steel preferred	35	36	+1		100	2,500,000	6 cum	3 S. A.	Jan., 1905
Fay & Egan	93½	93½	.....	Feb. 20	100	1,000,000	5	5 Q.	Nov., 1905
Fay & Egan preferred	128½	128½	.....		100	1,000,000	7 cum	7 Q.	Nov., 1905
General Electric	167¾	168¾	+1	May 8	100	48,256,050	8	8 Q.	Jan., 1906
International Pump	58	52¼	−5¾	June 5	100	12,282,500		2	July, 1905
International Pump preferred	90⅛	90⅝	+ ⅜		100	8,850,000	6 cum	6 Q.	May, 1906
Lackawanna Steel	71	71	.....	March 14	100	34,971,400		.....	.....
Lake Superior Corporation	19½	19	− ½	Oct. 3	100	40,000,000		.....	.....
Niles-Bement-Pond	130	130	.....	Feb. 7	100	5,000,000	6	6 Q.	May, 1906
Niles-Bement-Pond preferred	105	105	.....		100	2,000,000	6 cum	6 Q.	Mch., 1906
Otis Elevator Co	52	53	+1	March 19	100	6,350,300		2 A.	Apr., 1906
Otis Elevator Co. preferred	100	100	.....		100	5,589,500	6 n. c.	6 Q.	Apr., 1905
Pittsburg Coal Co	13⅝	14½	+ ⅛	Feb. 12	100	30,135,000		.....	.....
Pittsburg Coal preferred	54	54¾	+ ¾		100	30,716,200	7	.....	Apr., 1905
Pressed Steel Car	51½	51⅜	− ⅛	Feb. 21	100	12,500,000		3	Aug., 1904
Pressed Steel Car preferred	97⅜	97⅞	+ ⅛		100	12,500,000	7 n. c.	7 Q.	May, 1906
Pullman Palace Car	228	225	−3	Oct. 18	100	74,000,000		8 Q.	Feb., 1906
Railway Steel Spring	53	52⅜	− ⅝	March 1	100	13,500,000		4 S. A.	Oct., 1905
Railway Steel Spring preferred	102	102½	− ½		100	13,500,000	7 cum	7 Q.	Apr., 1905
Republic Iron & Steel	29	28⅜	− ⅝	Oct. 17	100	27,352,000		.....	.....
Republic Iron & Steel preferred	102⅝	101½	−1⅛		100	20,852,000	7 cum	7 Q.	Apr., 1906
Sloss-Sheffield	79¾	79½	+ ¼	March 14	100	7,500,000	5	5	Jan., 1906
Sloss-Sheffield preferred	112	110	−2		100	6,700,000	7 n. c.	7 Q.	Jan., 1906
Tennessee Coal & Iron	147½	147½	.....	May 15	100	22,552,800		4 Q.	Apr., 1906
U. S. Cast Iron Pipe & Foundry	49¼	48	−1¼	June 27	100	12,500,000		2	June, 1906
U. S. Cast Iron Pipe & Foundry preferred	92½	93¼	+ ¾		100	12,500,000	7 n. c.	7	June, 1906
U. S. Steel	41⅜	40⅞	− ⅝	April 16	100	508,302,500		.....	Dec., 1903
U. S. Steel preferred	106	105⅞	− ⅛		100	360,281,100	7 cum	7 Q.	Feb., 1905
U. S. Steel 5's	97¼	97⅜	+ ⅛		100	463,798,000	5	5 A.	
Virginia Iron, Coal & Coke	43	42	−1	Sept. 18	100	8,641,600		.....	.....
Westinghouse Electric	158	154	−4	June 27	50	20,990,350	10	10 Q.	Apr., 1906
Westinghouse Air Brake	149	148	−1	Oct. 2	50	10,990,450	20	20 Q.	Apr., 1906

NEWS FROM MANY INDUSTRIES.

New Buyers:—

The Columbus Die, Tool & Machine Co., Columbus, O., has been incorporated with a capital of $10,000 by George W. Syler, H. H. Price, S. S. Ford, C. E. Westervelt and G. R. Lucas.

The Waxahachie Machinery Co., Waxahachie, Tex., has been incorporated with a capital of $16,500 to do a general machinery manufacturing business. The incorporators are: A. H. Paillet, E. M. Murphee and W. L. Butler.

The Columbus Tool & Supply Co., Columbus, O., has been organized with a capitalization of $50,000 to manufacture and sell all kinds of tools and machine supplies. The incorporators are: Carter J. Buttes, Grant Cusac, Charles H. Tilton, Waldo T. Gray and Andrew J. Pembroke.

The Cook-Lewis Foundry Co., of Greensboro, Va., has been organized with a capital of $25,000 by W. B. Cook and A. R. Lewis.

The Hydro-Carbon Furnace Co., St. Louis, Mo., has been incorporated with a capitalization of $80,000 by George A. Wells, Eddy H. Hovey and R. E. Desmond.

The F. K. Russell Machine Co., Dallas, Tex., has been incorporated with a capital of $25,000 by F. K. Russell and others.

The H. Ruesch Machine Co., No. 22 Green street, Newark, N. J., tool maker, machinist, founder and mechanical and electrical engineer, has been incorporated with a capital stock of $100,000. The incorporators are Henry J. Reusch, Herman F. Behrendt and Albertina J. Reusch, all of Newark, N. J.

The Jeffrey Mfg. Co., Columbus, O., has increased its capital stock from $1,000,000 to $6,000,000, of this, however, only $200,000 will be issued at present.

The Ocala Iron Works, Ocala, Fla., has been organized with a capital of $100,000 to take over, enlarge and operate the Ocala Foundry & Machine Works.

The Prosser Engineering Co., Cleveland, O., has been incorporated with a capital of $10,000 by Joseph E. Prosser, Willis E. White, A. H. Hill, James H. Griswold and R. Bailey.

The Bradner Machine & Tool Co., Bradner, Wood county, O., has been incorporated with a capital of $12,000 by W. P. Tyler, Geo. P. Ahn, R. W. Barton, Rathbun Fuller and Birchard A. Hayes.

The Acme Steel Tube & Wheel Co., Saginaw, Mich., has been organized with a capitalization of $1,500,000 by F. S. Leggitt, A. L. Christy, T. M. Hill, J. T. Bealer, S. H. Boss, B. H. Ryder, Geo. F. Mercer, James Staphlet, George H. Everson, William Campbell, E. C. Drum, C. H. Drum, J. E. Masters and D. Lewis, all of Pittsburg. T. W. McGlone is the promoter of the enterprise.

The Valley Forge Foundry Co., Valley Forge, Pa., has been organized with a capitalization of $5,000 for the manufacture and sale of metallic castings. The incorporators are: Ernest Henning, Philadelphia; William C. Lilly and Edgar S. Waters, Valley Forge.

The Dayton Keyless Lock Co., Dayton, O., has been incorporated with a capital of $20,000 by Joseph J. Deal, George F. Deal, Charles M. Burke, Daniel Nevins and Louis Walker.

The Buckeye Tool Co., Leetonia, O., has been organized with a capitalization of $10,000 by H. T. Collins, C. G. Wildeson, W.G. Bliss, Elmer Harrold and R. C. Harrold.

The Monarch Valve & Mfg. Co., valves, valve gats, machinery, etc., has been incorporated with a capital stock of $75,000. The incorporators are: President, Charles J. Roadstrand, Springfield, Mass.; treasurer, Stuart M. Robson, Springfield, Mass.; clerk, H. E. Jovion; Indian Orchard, Mass.

M. Glauber & Co., with an authorized capital stock of $30,000, have been incorporated to manufacture machinery, tools, etc. The incorporators are Sam F. Butterworth, Morristown, N. J.; Edward B. Bruce, 201 West 55th street; John J. Daly, 52 Williams street, both of New York.

The Ford Steel Column Co. has been granted a charter in Massachusetts to manufacture iron, steel, metals, etc. The capital stock is $25,000 and the incorporators are: President, Fred A. Ewell, 1433 Washington street, Boston; treasurer, A. W. Ford, Wollaston, Mass.; clerk, G. W. Faulkner, Cambridge, Mass.

The Massachusetts Brass & Iron Co. has been incorporated with a capital stock of $75,000 to manufacture castings, machinery, pumps, etc. The officers are: President M. E. McQuire, Boston, Mass.; treasurer, H. Wellington, Brookline, Mass; clerk, George T. Shannon, Boston, Mass.

The H. G. Kotten Co. has been incorporated for the purpose of manufacturing and selling engines, pneumatic tools, etc. The capital stock is $200,000, and the incorporators are: George S. Dayton and Herman G. Kotten, Englewood, N. J., and George W. Knappmann, Brooklyn.

W. S. Barstow & Co. has been chartered to carry on electrical and mechanical engineering. The capital stock is $125,000, and the incorporators are: William S. Barstow, 301 West 108th street; O. Clement Swenson, 607 Third avenue, both of New York; and Joseph B. Taylor, 945 President street, Brooklyn.

The Reading Steel Casting Co., West Orange, N. J., has been granted a charter to operate a machine shop, pattern shop, etc. The capital stock is $125,000, and the incorporators are: Daniel W. Locklay, 319 West Twenty-ninth street, and William Conover, 502 West 151st street, New York; and S. J. Wheeler, 445 Seventh avenue, Roselle, N. J.

The Worcester Plunger Elevator Co. has been chartered with a capital stock of $50,000 to manufacture elevators and engines. The officers are: President, W. E. Waterhouse; treasurer, G. H. Stevens; clerk, B. A. Oakes, Melrose, Mass.

New Construction:—

The Springfield Foundry Co., Springfield, Mass., will erect a foundry 110 x 280 feet, one end of which will be three stories in height, the balance of the building being devoted to regular foundry purposes. The plant will be equipped with steam, air compressor, traveling and jib cranes, etc., and a high grade of gray iron castings will be turned out. W. F. Callendar is president, James Hale secretary and Davis Hale, treasurer.

The Ward Fence Co., Portland, Ind., which is soon to move to Marion, Ind., will have its plant at the latter place in operation by Sept. 1. Ground will be broken at once for the first building which will be 80 x 250 feet. Modern equipment will be installed for the manufacture of all kinds of fencing, gates, railings, etc. Harry Ward is president and general manager and M. Earl Bracket, secretary and treasurer.

The Jackson-Church-Wilcox Co., Saginaw, Mich., manufacturer of light machinery and automobile parts, has leased a building of ample capacity to answer its purposes for some time, and has contracts on hand to keep its plant in operation for almost a year. All necessary machinery has been purchased, and operations will be begun in a short time. A feature will be made of three to five-ton automobile delivery cars. J. L. Jackson is president, W. L. Wilcox, vice president, and E. D. Church, secretary and treasurer.

The Paxton & Vierling Iron Works, Omaha, Neb., manufacturing structural

and ornamental iron and steel, will erect a structural shop 100 x 300 feet on a tract of 1½ acres of ground across from its present plant. The site which was recently purchased will also materially increase the switching facilities of the works. The new plant will be modernly equipped for manufacturing structural steel for buildings, bridges, etc. Tools and electrical machinery have been purchased, and the contracts now on hand will tax the capacity of the company for the present year.

The Kerr-Murray Mfg. Co., Ft. Wayne, Ind., manufacturing gas work machinery and gas holders, finds its present factory much too small for the requirements of its business, and has secured a tract near Ft. Wayne, on which preliminary work for an extensive plant is practically completed The new plant is being designed by Dodge & Day, engineers of Philadelphia.

The Klotz Machine Co., Sandusky, O., has completed the remodeling of its foundry and the erection of a three-story brick building 60 x 120 feet for machine shop and pattern shop purposes. A five-ton traveling crane and an assortment of machinery were recently installed, enabling the company to care for a large amount of job work in addition to its regular line of axe handling machinery and wine makers' machinery.

The American Axle Works, Philadelphia, is considering additions to its plant, which will increase its capacity about fifty per cent. Dodge & Day, of that city, are engineers in charge.

The Wallace Machine & Foundry Co., LaFayette, Ind., is adding a building 50 x 100 feet to its present foundry and will operate it as a structural iron shop.

The Baldwin Locomotive Works, which recently secured the Gruson Iron Works at Eddystone, near Chester, Pa., has let the contracts for additions which will materially increase the capacity of that plant. It will be used chiefly as a foundry and general blacksmith shop and will furnish the heavy castings which the company has of late been forced to buy from several foundries in various parts of the country.

The Humphrey Mfg. Co., Towanda, Pa., has let the contract to L. E. Parkinson, of Elkins, W. Va., for a manufacturing plant, consisting of a machine shop, foundry, pattern shop and boiler house.

The El Paso Foundry & Machine Co., El Paso, Tex., has purchased a site of 30 acres and an extensive plant will be erected within the near future.

H. J. Wessinger, Duluth, Minn., has purchased a tract of land in West Duluth, and will erect a plant of the manufacture of a number of mining machinery appliances of which he is the inventor. A building 45 x 150 feet will be erected at once and additions will be made as business warrants. Associated with Mr. Wessinger, who is chief mechanical engineer of the Oliver Iron Mining Co., is his brother, William E. Wessinger, also connected with the same interests.

The Mitchell Safe Co., Minneapolis, Minn., is to erect a plant 54 x 140 feet of brick construction.

The J. D. Randall Co., Cincinnati, has taken out a permit for a four-story brick machine shop to cost $15,000.

The R. K. LeBlond Machine Tool Co., Linwood, Cincinnati, O., is preparing plans for extensions which will double the capacity of its present plant. These will take the shape of wings. A one-story machine shop, a three-story office and drafting department, a pattern shop and a shipping department will be added.

The Smith Machine Co., Milwaukee, Wis., manufacturing concrete mixers, has let the contract for a machine shop 100 x 260 feet which with equipment will cost about $37,000.

The Golden Foundry & Machine Co., Columbus, O., has purchased land adjoining its present plant, and will materially increase its capacity.

The Maryland Brass & Metal Works, Guilford and Girard avenues, Baltimore, Md., owned and operated by Wm. Gisriel & Son, is to be extended across the street to a plot of ground 327 by 254 feet upon which will be erected a large steel building occupying the entire ground space. The new building will be used for smelting and refining operations.

General Industrial Notes:—

The Atlanta Steel Hoop Co., Atlanta, Ga., now has its new plant in complete operation, turning out nails, steel rails and steel hoops. Five hundred workmen are employed. C. E. Currier is president, S. T. Weyman vice president, G. W. Conners secretary, W. M. Hoke assistant secretary and S. S. Paul sales agent.

W. H. Fetters and associates of Scottdale, Pa., have purchased the rolling mill at Norwich, Va., for $30,000 and will organize a company for its operation.

The Crane Iron Co., Catasauqua, Pa., has re-elected Leonard Peckitt president; J. R. Stillman was elected secretary; James M. Hodge treasurer, and the following were chosen to the directory board for the ensuing year; E. R. Chapman, Mark T. Cox, B. F. Jeffrey, James W. Fuller, Leonard Peckitt and Arthur Fouler. No. 3 furnace is being relined and will soon be put in operation.

The Star and Crescent furnace, Rusk, Tex., is being overhauled with the intention of starting up within a short time.

The Noble & Wood Machine Co., Troy, N. Y., at the recent annual meeting, chose the following officers: Frank L. Stevens, president; James A. Noble, vice president and general manager; H. P. Blackington, secretary and treasurer.

The work of dismantling the rolling mill plant of the Central Steel Co., Indianapolis, Ind., has been practically completed. The large engine was shipped to the Superior Steel Co., Carnegie, Pa., and the remainder of the machinery was scrapped.

The Capital Lock-Nut & Washer Co., Columbus, O., has organized by electing the following officers: T. H. Ryan, formerly in charge of the coal properties of the Colorado Fuel & Iron Co., president; A. N. Gaines, also connected with the Colorado company, vice president and general manager; L. R. Ayres, secretary; and J. Zettler Krumm, treasurer; A. O. Glock, F. C. Hubbard, H. B. Hutchinson, J. C. Rodgers and E. R. Rutherford additional directors. The plant is now ready for operation, making nuts, bolts, washers and a patent nut-lock and washer. The capitalization of the company has been increased from a nominal figure to $750,000.

The J. B. Foote Fdy. Co., Fredericktown, O., recently incoroporated, takes over the business in the manufacture of bells and hardware specialties which has been running for the past five years under the present management. The bell factory at Fredericktown has been operated for over half a century and is one of the oldest in the United States.

The furnace of the Reading Iron Co., at Emaus, Pa., has been blown out for repairs.

The alterations undertaken some time ago at the Secaucus plant of the Hudson Iron Co. have been completed, and the furnace is ready for blast. It will not be blown in until nearly the end of June when both of the company's mines are expected to be in operation.

Locomotive exports from the United States to Brazil have decreased from $1,648,758 in 1895 to $117,086 in 1905. Machinery still constitutes one of the principal lines of trade with that country.

Fires:—

The Columbus Bolt Works, Columbus, O., sustained a loss of about $3,000 May 15 in a fire which was started by a heated forge. The loss was amply covered by insurance and no delay was occasioned.

The Bessemer Coal, Iron & Land Co., Bessemer, Ala., will at once rebuild its commissary at Belle Ellen which was destroyed by fire a short time ago with a loss of about $20,000, practically covered by insurance.

The large foundry of the J. P. Symons Co., Centralia, Wash., was gutted by fire May 12, the loss on plant and equipment being about $15,000, with a heavy additional loss through the destruction of many valuable patterns.

The plant of the Chattanooga Car & Fdy. Co., Chattanooga, Tenn., was threatened May 13 by a fire originating from an explosion of gas in the coal room. The flames were extinguished, however, with a loss of only $1,000.

Trade Notes:—

The Niles-Bement-Pond Co. will have one of its extra heavy 90-inch driving wheel chucking lathes in full operation during the Master Car Builders' and Master Mechanics' conventions, to be held at Atlantic City, June 13 to 20. Owing to its great weight, this machine cannot be shown on the steel pier, and a special booth, two minutes' walk south from Pennsylvania station, on New York avenue, near Atlantic avenue, has been built.

The United States Cast Iron Pipe & Foundry Co. lost its San Francisco offices in the Rialto building during the recent disaster, and has secured temporary quarters at 951 Eddy street, San Francisco.

The William Graver Tank Works has established its offices at East Chicago, Ind., where all correspondence should be addressed. Only a sales office will be maintained at the old address, 1409-1177 Jackson Boulevard.

The Allis-Chalmers Co., in addition to its office recently established at 906 Broadway, Oakland, Cal., has opened quarters in the Atlas building, 602 Mission street, "New" San Francisco.

The Northern Engineering Works, Detroit, Mich., has recently added a No. 52 Newten cupola to the equipment of the Geneva Foundry & Machine Co., Geneva, N. Y.

Wood & Huddart are now located at 2123 Pierce street, San Francisco, where they are in position to furnish structural material, rails, wrought pipe and lock bar pipe.

TRADE PUBLICATIONS.

The Wellman-Seaver-Morgan Co., Cleveland, is distributing a catalog of self-contained geared hoists. This describes a line of engine driven hoists of various sizes and capacities ranging from 950 to 8,300 pounds load. These are thoroughly described and illustrated. The dimensions, capacities and all necessary information regarding them are given in the form of tables.

The Crocker-Wheeler Co., Ampere, N. J., has issued bulletin No. 64, describing direct current motors ranging from 3 to 45 horsepower and direct current generators ranging from 2½ to 40 kilowatts. Not only are the motors described, but a large number of their applications are shown, namely, the driving of sensitive drills, boring mills, planers, lathe, hoists, etc. The bulletin includes a table of the principal dimensions of the machine.

The Allis-Chalmers Co., Milwaukee, has issued bulletin No. 1,412 describing crushing rolls. This bulletin describes and illustrates three styles of crushing rolls, formerly known as the Gates high grade roll, the Fraser & Chalmers standard roll and the Fraser & Chalmers old style belt roll. Each type of machine is thoroughly described and illustrated. A list of possible uses of each is given, together with the arrangement of crushing plants and directions for operations. The bulletin contains considerable information of value to users of this type of machinery.

Ross Engineering Co., 1 Madison avenue, New York, has recently gotten out a publication entitled "Mechanical Firing," which is devoted principally to the description of the Ross mechanical stoker. This stoker is of the inclined type with rocking grate bars, the coal being fed into a hopper in the front and passing down underneath a fire brick arch. The first few pages of the publication are devoted to a short article on the advantages of regular firing and smokeless combustion. The publication is an extremely handsome one from a typographical standpoint, and is printed in two colors on strathmore paper with unfinished edges.

The Murray Iron Works, Burlington,Iowa, has brought out a catalog describing the Murray Corliss engines. The catalog comprises 75 9 x 12 pages, and contains a short history of the Corliss engine followed by illustrations of the Murray Corliss engines of the girder frame type. These are built in sizes ranging from 50 to 600 horsepower. Following these are a number of illustrations of the Murray Corliss engines of the tangye frame type. These are being built in sizes ranging from 100 to 1,300 horsepower. The remainder of the book is devoted to illustrations and descriptions of details, such as cylinders, valve motion, governors, pistons, cross heads, connecting rods, etc. In addition to these are also described the Murray two-stage compound air compressor and high duty pumping engines. The Murray water tube boiler is also described and illustrated.

Colorado Fuel Plans.—President Hearne of the Colorado Fuel & Iron Co. states that, notwithstanding the failure of shareholders to subscribe for a new issue of securities under terms recently announced, "every share of stock and bond offered will be subscribed by a strong underwriting syndicate and the financial plans of the company will be completed precisely as originally intended." In order to raise funds for the improvement of certain of its plants, the company offered its shareholders $2,000,000, par value, of its common stock and $4,000,000, par value, 5 per cent bonds, Series B, of the Colorado Industrial Co., held in the treasury of the fuel and iron company. Since the announcement of this offer quotations of both companies have slumped heavily, to such an extent in fact that for a shareholder to avail himself of the proposition meant to incur an actual loss. It is announced that there is no basis for the report that the company is seeking control of the Victor Fuel Co.

Ship Canal Terminal.—The lake terminal of the proposed Lake Erie & Pittsburg ship canal is to be at a point about four miles northeast of Geneva, O. Promoters of the company during the past week announced the purchase of a tract of 1,200 acres at this point, more than 20 farms being secured at a total cost of over $100,000. The senate committee has reported favorably on the bill granting the company a national charter, and it is stated that as soon as this is secured work will be begun.

Welsh Tin Plate Trade.—A marked depression in the tin plate trade at Wales is reported by Consul Williams, of Cardiff. It began to be felt when the disturbance occurred last year in the Russian oil field and has been increased by steady decline in exports to Canada and the United States, which for the past quarter have approached 50 per cent. Some mills have closed and others will be forced to stop unless conditions change at an early date.

ENGINEERS' TRAINING

Discussed in Report of an Eminent British Committee.

In November, 1903, the council of the Institution of Civil Engineers of England appointed a special committee "to consider and report . . . as to the best method of training for all classes of engineers." In order that the committee might be representative and strong, the leading British engineering societies were invited to nominate members of eminence in every branch of engineering. This invitation was accepted, men of the highest reputation were appointed, and the work of inquiry and investigation was thoroughly conducted. The *London Times* summarizes the report as follows:

The first set of recommendations deals with "Preparatory Education" of boys intended for the engineering profession. Such boys, it is considered, should continue at school until they are about 17 years of age, and should receive a sound general education, embracing elementary Latin and modern languages, but no Greek. Mathematics should be well taught, and special attention devoted to geomctrical methods and drawing. Handicrafts—such as carpentry, turning, etc.—should be encouraged as recreations, not made "school exercises." Elementary physics and chemistry should be included in the syllabus. The committee supports the system of "leaving certificates" for secondary schools, are opposed to undue multiplication of examinations for entrance to technical institutions, but emphasize the waste of time and effort now occuring in these institutions in consequence of the faulty school-training of boys. Briefly summarized, the recommendations are opposed to early specialization in training, and favor a good general education on modern lines, with certain subjects added or treated with special care. Parents and schoolmasters should find this section of the report of great value.

The second set of recommendations deals with engineering training; and (to quote their own words) "the committee has had in view throughout what may be termed an 'average boy' of ordinary ability whose parents are in a position to secure him a thorough training before he begins his actual professional work as an engineer." Obviously the committe has proceeded on rational lines in taking this course. No doubt there are "born engineers" to whom no other career is possible, and whose training may be left largely to take care of itself. Men may become engineers late in life, and by passing from other professions, as did Lord Armstrong, while many who have attained eminence (like Stephenson) have forced their way against adverse circumstances and had little systematic training. In future, as in the past, British engineers will be recruited by men who have traversed different roads to eminence; but the "average boy" of this report will furnish the bulk of the profession, and the committee has done well to indicate the best route along which such boys may travel in preparing for their life-work. For such aspirants, under modern conditions, the committee recommends thorough training in both the practice and the science of engineering. It prefaces its recommendations by the unanimous opinion "that engineering training must include several years of practical work as well as a proper academic training." The ideal course, in its judgment, is briefly as follows:—Leaving school well prepared about the age of 17, a boy should spend at least one year in mechanical engineering workshops, keeping regular working hours and being subject to discipline. During this period care should be taken to maintain his scholastic acquirements by private tuition or evening classes, and every endeavor should be made—"without undue physical strain"—to add to knowledge. This introductory workshop course would be succeeded by a course of study of three or four years spent in a technical college or university. Students of special ability might possibly take a shorter course. The first session might advantageously be made to cover a course of study common to all students, specialization in instruction for particular branches of engineering being deferred to the later sessions.

Practical training would be resumed and completed on the conclusion of the college course. In some cases—as in Scotland, where summer vacations are long—practical and theoretical training might alternate. Ordinarily (in addition to the workshop year) two to three years should be devoted to practical training, "in workshops, works, or mines, and in offices, as may be required in each case." The committee favors the longer period of practical training; and it must not be overlooked that the total period of training—say, three years' college and four years' practical—is not to begin until a boy is 17 years of age. As men having large experience of actual work and responsibility and of the attainments necessary for modern engineers, the members of the committee aim at the production of real practical engineers, skilled in the science of their profession and capable of dealing with new problems as they arise. The committee includes men who have given proof of their scientific knowledge and practical capability, and they are opposed to schemes which produce mere theorists or bookish students of engineering literature. Engineers exist for the purpose of doing things; science and practice must go hand in hand. The committee appeals, in conclusion, for that "sympathetic assistance of employers which is essential to improvement in engineering education and training." Here they strike a true note, and the example of Germany, the United States, and other countries demonstrates what such sympathetic assistance may accomplish. It is not wanting in this country, for many large employers and great companies have granted facilities to students again and again. At the same time, greater and more general readiness to assist has been shown abroad. For instance, in Germany, when the "workshop year" preliminary to entry at the technical universities was contemplated, a large number of firms at once offered facilities, and in a short time 520 places for students were made available in engine factories, iron works, electrical works, ship yards, etc. The committee recognizes that there are practical difficulties in carrying out a similar scheme in this country, but "the advantageous effect in training leads it to hope that practical trial may be given to the suggestion." This hope, we trust, may be fulfilled.

There are many other matters of importance in the report, to which reference cannot here be made. It is worth serious study by all who are interested in engineering education and the maintenance of the great position which British engineering attained in the last century, and still holds.

Progress in Forgings.—"During the past decade," says *The Iron & Coal Trades Review*, "in no branch of manufacture allied to ship and marine engine building has such progress or advance been made as in that of the manufacture of forgings and castings. Whereas in 1895 a large proportion of marine engine and ship forgings were produced—more especially for cargo boats—by the old-fashioned practice of building up from miscellaneous pieces of scrap iron and steel, today we find such are the exception, and that their place has been taken by special steels, scientifically produced by the Siemens-Martin acid process.

MILLION DOLLARS PAID

By Lake Superior Corporation.—Government Renews Its Guaranty.

Toronto, Can., May 12.—One-half of the $2,000,000 loan secured by the Lake Superior Corporation, of Sault Ste. Marie, and guaranteed by the Ontario government having been paid off, the government has renewed its guarantee for six months on the loan for the remaining $1,000,000. R. Wilson Smith, a director of the company, states that the net earnings of the fiscal year ending June 30 next, will be from $1,000,000 to $1,250,000. With the addition to the plant of two new blast furnaces, now under construction, the present capacity of the steel rail mills, which are now turning out from 600 to 800 tons per day, can be nearly doubled.

At a meeting of the directors of the Hamilton (Ont.) Steel & Iron Co., held April 30, it was decided to erect a second blast furnace with a capacity of 400 tons per day. It has not as yet been settled whether the new plant will be located in Hamilton or at some point on Lake Erie. Operations in the new spike plant of the company, a new building for which has just been completed, will be commenced in a few days. At first only one spike machine will be used, employing 12 or 15 men, but it is expected to develop into an important branch of the business.

An important trade union case was decided May 1 by the divisional court, which dismissed with costs an appeal taken by local union No. 30 Amalgamated Sheet Metal Workers, against a judgment awarding the Toronto Metal Roofing Co. $7,500 damages and costs. The union asked the company to sign an agreement involving the dismissal of non-union employes and as the result of the refusal to do so a strike was ordered, accompanied by a boycott, the effect of which was damaging to the company's business. The company thereupon brought action for damages against the officers of the union with the result above stated. The divisional court in dismissing the appeal found that the verdict was founded on the evidence and that there was no error in the judge's charge, or in the reception of the evidence, which should induce any interference by an appellate court.

The Meisell Mfg. Co., of Port Huron, Mich., is about to establish a branch plant in Winnipeg for the manufacture and repair of flour milling machinery, etc.

The reorganization of the Henderson Roller Bearing Mfg. Co., Ltd., of Toronto, is almost completed. A new company has been incorporated under the name of Dominion Henderson Bearings, Ltd., and the assets of the old company will be transferred to it.

The Bridge and Structural Iron Workers' Union has made an agreement with the employers to continue for one year under which wages are fixed at 30 cents per hour for a nine-hour day, with time and a half for overtime and double time on holidays. The new scale is an advance of 10 per cent.

The Rapid Tool Co., Ltd., Peterborough, $40,000, has been incorporated with Wm. Rudkins, William Quinn and Gustavus L. Hay as provisional directors.

Six thousand tons of steel rails have been ordered by J. J. Hill from the Dominion Iron & Steel Co., of Sydney, N. S., for the Victoria, Vancouver & Eastern railway in British Columbia. These rails will be shipped by water round Cape Horn on account of the high railroad freight rates, which will effect a saving of several thousand dollars.

DIFFICULT OPERATIONS

Crowned by Success of Corrigan, McKinney & Co. in Stambaugh Valley.

Norway, Mich., May 17.—The newly organized Rhodes Iron Co., of which John C. Eden, of Chicago, is president and which is operating a number of mines on the Mesabi, has taken an option on the Morgan property, in the Iron River district of the Menominee range, and is preparing to begin diamond drill operations there. The Morgan is very favorably located. It adjoins the Caspian mine of Pickands, Mather & Co. and the McGillis and Fogarty properties. Some exploring was done on the tract a few years ago, but not enough to determine its mineral worth. It is understood that the Rhodes company is also to come into possession of the Section 12 mine, adjoining the Baltic and the Fogarty, and considered one of the most promising properties in the district. The mine has been opened up to the third level, on which a fine body of ore was recently encountered. It is controlled by the G. W. Youngs Mining Co. The Buffalo & Susquehanna Co. has abandoned the Kinney property, a tract in the Iron River field, nothing having been found there, and has transferred the drill to the Buchholtz property, where it is now in commission.

Difficult operations extending over a period of several months have been successfully concluded by Corrigan, McKinney & Co., in the Stambaugh valley, the ledge overcapping the ore body at the Baker property having been penetrated at a depth of about 100 feet. The overburden was quicksand and gravel, and the work of sinking through it constituted a problem which other companies that at different times held the tract under option did not care to tackle. Both the drop method and the lathing system were used by Corrigan, McKinney & Co., and although the sinking was very slow and tedious it has been attended with entire success. The ledge proved to be an ore formation running about 40 per cent iron. It was not intended that the shaft should strike the clean ore, and it was put down at a location some distance from the point where the deposit was penetrated by the drills. Now that the shaft has been ledged, the sinking will progress much more rapidly. It is expected that a fine mine will be opened.

An extensive cavein occurred recently at the old Quinnesec mine, near Norway, Menominee range. About an acre of ground gave way and fell a distance of about a hundred feet into the abandoned workings with a crash that for a time occasioned consternation among the people of the location, it being thought for a while that an earthquake had occurred. The waterworks pipe leading from the pumping station to the reservoir was broken by the collapse of the surface beneath it. There are no buildings at the mine, except the old engine house, from which the machinery has been removed, and no particular damage can be done if the entire surface gives way. The Pewabic Mining Co.'s property at Waucedah, which has been in course of development for the past year or two, will this season ship somewhat more than the 25,000 tons forwarded last year. The ore is low in metallic iron, but there is a considerable body of it and it is the expectation that the quality will improve with depth. It is reported in mining circles that the Clergue interests have become interested with the S. Dessau Co. in the Millie mine at Iron Mountain. A circumstance presumably confirmatory of this is that the Millie has been shipping some ore to the steel plant of the Consolidated Lake Superior Co. at the Canadian Soo. The freight on this ore has averaged about $30 a car.

The American Car & Fdy. Co., Trafford Park, Manchester, Eng., has booked an order for 230 cars for the Antofagasta & Bolivia railway. For the Charing Cross, Euston & Hampstead railway 150 cars are now being constructed.